ANNUAL MEETING
INDIANA VETERINARY MEDICAL ASSOCIATION
INDIANAPOLIS
JANUARY 9 - 11, 1940.

1940
ANNUAL MEETING
# of the
INDIANA VETERINARY MEDICAL ASSOCIATION

- - - - - - - - -

OFFICERS OF THE ASSOCIATION

Dr. D. D. Baker, Wabash - President
Dr. R. E. Kepner, New Castle - Vice President
Dr. Charles C. Dobson, New Augusta - Secy-Treasurer

Board of Directors

Dr. J. L. Axby, Indianapolis - Chairman
Dr. G. E. Botkin, Marion, Vice-Chairman
Dr. H. Meade Hamilton, Muncie
Dr. J. E. Tinder, Brook
Dr. E. S. Hinkle, Centerville
Dr. J. L. Kixmiller, Indianapolis

- - - - - - - - - -

Severin Hotel
Indianapolis
January 9 - 11, 1940

- - - - - - - - - - -

Reported and Mimeographed
by
Estora Whitaker
906 Roosevelt Bldg.
Indianapolis

- - - -

COMMITTEES FOR 1940

Legislative Committee:

Dr. A. C. Spivey, Thorntown, Ind., Chairman
Dr. J. L. Axby, Indianapolis, Indiana
Dr. Clifford C. Carpenter, Ft. Wayne
Dr. F. E. Catt, Arlington, Indiana
Dr. Arnold Danforth, Winchester, Indiana
Dr. H. F. Emick, Indianapolis, Indiana
Dr. C. P. Hodson, Peru, Indiana
Dr. John L. Hetherington, Bloomington
Dr. Earl Higgins, Bluffton, Indiana
Dr. G. W. Musselman, Denver, Indiana
Dr. J. E. Tinder, Brook, Indiana
Dr. Glen Ebright, Hammond, Indiana

Mobilization Day:

Dr. Charles C. Dobson, New Augusta, Indiana

Resolutions Committee:

Dr. H. Meade Hamilton, Muncie, Chairman
Dr. Wayne Alter, St. Paul
Dr. D. D. Baker, Wabash, Indiana
Dr. C. O. Petry, Ossian, Indiana

Necrology Committee:

Dr. F. W. Bratten, McCordsville, Chairman
Dr. Roscoe Hyde, Hartford City, Indiana
Dr. W. H. Lindley, Lawrenceburg, Indiana

By-Laws Committee:

Dr. G. W. Wagaman, Kokomo, Chairman
Dr. H. E. Bryan, Angola, Indiana
Dr. H. W. Demsey, Huntington, Indiana

Program Committee:

Dr. F. H. Brown, Indianapolis, Chairman
Dr. E. S. Hinkle, Centerville, Indiana
Dr. G. E. Botkin, Marion, Indiana

Publicity Committee:

Dr. R. F. Dean, North Salem, Chairman
Dr. W. K. York, Indianapolis, Indiana
Dr. C. C. Donelson, Indianapolis

Entertainment Committee:

Dr. J. C. Schoenlaub, Indianapolis, Chairman
Dr. O. B. Curry, Morristown, Indiana
Dr. J. L. Kixmiller, Indianapolis
Dr. H. R. Brown, Manilla, Indiana

Finance Committee:

Dr. H. J. Weaver, Hagerstown, Chairman
Dr. H. M. Bonifield, Warren, Indiana
Dr. Walker France, Booneville, Indiana

Small Animal Committee:

Dr. H. J. Magrane, Mishawaka, Chairman
Dr. H. Meade Hamilton, Muncie, Indiana
Dr. R. J. Hoskins, Indianapolis, Indiana
Dr. A. F. Ferguson, Lafontaine, Indiana

Large Animal Committee:

Dr. T. A. Sigler, Greencastle, Chairman
Dr. D. D. Bradbury, Fairbanks, Indiana
Dr. D. D. Baker, Wabash, Indiana

Poultry Committee:

Dr. F. C. Tucker, Claypool, Indiana, Chairman
Dr. R. F. Smith, Boswell, Indiana
Dr. W. C. Kortenber, New Haven, Indiana

CONTENTS

Pages

Committees for 1940 . . . . a - b

Business Session:

New Officers 1
Amendment to Constitution & Bylaws . . . 1
M-Day 1
Address of President Baker 3

Reports of Committees:

Public Relations & Publicity 5
In Memoriam 7
Large Animal Disease 8
A. V. M. A. Committee 9
Indiana Regulatory Work 10
Federal-State Co-operative Livestock Disease Control 21

Addresses:

Small Animal Practice - Dr. R. L. Tinkham . .23

Important Poultry Disease Problems Facing the Practitioner - C. A. Brandly 29

Some Common Conditions Met in Dairy Practice - Dr. Herbert Lothe 35

How Can the Veterinarian Best Co-Operate with the State Board of Health - J. W. Jackson, M. D. 42

Post-Vaccination Troubles in Swine - Dr. P. V. Neuzil 48

Equine Practice - Dr. C. C. Franks 63

Lameness - Dr. C. C. Franks 70

Addresses: (Continued) Pages

Indiana Sheep Problems - Dr. George L. Clark . . . 75

Presentation of Dr. Craig's Picture to Purdue - Dr. Axby 77

Acceptance Speech - Dr. Elliott . . . 79

Contributors to Craig Portrait Fund . 81

Presentation of Gold Keys to Past Presidents - Dr. R. E. Kepner 85

Reproductive Disorders in Cattle - Dr. Charles E. Fanslau 86

- - - -

Closing Business Session 89

- - - -

Address:

Infectious Anemia in Horses - Dr. W. S. Gochenour 90

* * *

MINUTES
# of the
INDIANA VETERINARY MEDICAL ASSOCIATION

Severin Hotel, Indianapolis
January 9 - 11, 1940

The Fifty-second Annual Meeting of the Indiana Veterinary Medical Association was called to order by President D. D. Baker, Wabash, at 9:30 A. M., January 9, 1940.

Reading of the minutes and roll call were dispensed with. The report of the Secretary-treasurer was approved and accepted.

New officers elected were Dr. R. E. Kepner, New Castle, President; Dr. G. E. Botkin, Marion, Vice President; Dr. Charles C. Dobson, New Augusta, Secretary-treasurer; Dr. H. W. Brown, Fort Wayne, and Dr. J. E. Carrico, Bicknell, to the Board of Directors.

The Board of Directors consist of the following:

Dr. J. L. Axby, Indianapolis,	Term	expires	1941
Dr. J. E. Tinder, Brook,	"	"	1941
Dr. E. S. Hinkle, Centerville,	"	"	1942
Dr. J. L. Kixmiller, Indianapolis	"	"	1942
Dr. H. W. Brown, Fort Wayne,	"	"	1943
Dr. J. E. Carrico, Bicknell,	"	"	1943

Dr. J. L. Axby, State Veterinarian, and Dr. Frank H. Brown, Indianapolis, were elected to the A. V. M. A. House of Representatives as Delegate and Alternate for the term of two years.

The Constitution and By-laws amendment outlined below received its final reading, was voted upon, passed and placed in effect:

ARTICLE III, Section 1, shall read as follows: "The nomination of officers shall be made on the afternoon of the first day of the Association meeting at 5:00 o'clock P. M. from the floor, and that the nominations stay open until 11:00 o'clock A. M. the following day, at which time the Chair shall entertain a motion that the nominations be closed and the election held."

That ARTICLE VIII - Fees of officers be amended to read: "All offices held in this corporation under the by-laws thereof are hereby declared to be places of trust and honor, to which no fee or emolument is attached except the office of Secretary, who shall receive such salary and allowances as may be recommended by the Executive Board and approved by the Association."

Dr. C. Harvey Smith, Dr. G. L. Clark, Dr. C. T. Howard.

M - DAY

Under Federal Laws made and provided, per the event we should become at war, it is therein so provided for "Mobilization Day."

A request was submitted to the Indiana Veterinary Medical Association to appoint a member to represent the Association if said day were so designated.

Favorable action was taken on this request and the President of the Association was authorized to make such appointment, said appointee to work in co-operation with the duly appointed committee of the Indiana State Medical Association.

- - -

The film on Infectious Anemia in Horses shown and explained by Dr. W. S. Gochenour, was well received, and has occasioned much favorable comment from the Assembly.

The sound picture on Reproductive Disorders in Horses and Cattle, supplied by Dr. Chas. E. Fanslau, of the Winthrop Chemical Company, New York, was enthusiastically received. It was the first appearance to Indiana Veterinarians.

The Indiana Veterinary Medical Association wishes to express its appreciation to the sponsors of both of these films, and extend a cordial invitation to return to the Association in the near future.

- - -

The Banquet, floor show and dance were attended by full capacity audiences. The total present was 280; in all, this was one of the most successful conventions Indiana veterinarians and their wives and friends have had the privilege of enjoying for many years.

- - -

ADDRESS OF THE PRESIDENT

Dr. D. D. Baker
Wabash, Indiana

Fellow Veterinarians, today begins the Fifty-second Annual Convention of the Indiana Veterinary Medical Association. For over fifty years veterinarians have gathered in annual session to develop and to promote the common interests of their profession.

As the standards have risen in agricultural development, so have the standards of our profession progressed to keep abreast of changes in a developing world.

Indiana ranks high in livestock production. In the past ten or fifteen years we have witnessed much improvement in the number and type of animals kept on Indiana farms. We have better beef cattle, higher producing dairy animals, more and better hogs, finer breeding sheep, and a great advance in poultry husbandry. We have only to recall such diseases as tuberculosis, contagious pleural pneumonia, foot and mouth disease, rabies, encephalomyelitis, hog cholera, European fowl plague, to satisfy ourselves that this high standard of livestock development has not been reached nor can it be maintained without the assistance of the trained veterinarian. It is our pride that we have served them. It is a satisfaction that we have played a part in this great movement so essential to our advancing civilization.

The demands placed upon the veterinary profession are high indeed. As years advance into other decades the demands will still be high. And not only in animal health do we serve, but more and more our services are demanded for the better safeguarding of human health. Public health work will be a great development in the veterinary profession in the next few years. I know that it is your desire that this Association go forward with the advancing demands of the world we serve.

In the last year or so all schools in the United States have raised their entrance requirements so all have a five-year course. One school has six. Montreal has eight. This denotes a higher standard of veterinary education. The enrollment is high in all schools. The desire for veterinary education is keen. Also the demand for well-trained veterinarians is keen. But these schools give first choice to those students matriculating from the home state. That is where Indiana students are greatly handicapped.

In traveling over the state visiting with different veterinarians and students, it has been my observation that veterinary

education in Indiana presents a great problem that we have to face at this time. When it takes all the friendly influence of the leading veterinarians in Indiana to get an out-of-state school to promise to do all they can to matriculate a veterinarian's son, or even a friend's son, in that school and then the prospective student is not allowed to enter, we have a problem. That is not just an individual problem. It has been a personal problem with many members in our Association in the past few years and I know they have not cared to burden the Association with their individual troubles. But I feel it has taken on aspects of a professional problem.

Who can we expect to fill the vacancies in Indiana? Is Indiana to become a backward state as far as veterinary medicine is concerned? Are we to depend upon the overflow from other states?

Veterinary colleges are taking a very few students from out of state. They are maintained by the citizens of their own state and primarily owe to their own citizens the facilities of their school. We have no claim to their veterinary education. Do they in turn have a claim to our field of practice? Are we to depend on this haphazard method of maintaining veterinary services in our state? Are Indiana sons to be deprived of their own birthright to practice veterinary medicine in their own state?

After discussing this problem with the Dean of Agriculture at Purdue, Dr. Reed, I feel that this Association should at this meeting devote some time, and possibly arrange a resolution or plan of action to try to solve this problem. At Purdue they have promised active support in conferring with heads of out-of-state schools and possibly arrange for preliminary training for a large number of students at Purdue, thereby relieving the strain of that school in the first two years of work.

Dr. Reed's first proposal was to offer the first two years of training for some Indiana and some Ohio students. Then they would proceed to Ohio for the last three years. This plan might be arranged between the two schools. My suggestion was that we try to contract with the trustees of Ohio State University for student reservations to be filled by Indiana students. Such an arrangement would have to be followed up by an appropriation by the state legislature to finance these reservations. The only appeal that another state would have in this arrangement would be that besides the tuition the total expense of student education would be borne by Indiana. There would be no cost to the Ohio taxpayers for educating our students under such

an arrangement. We would be supporting a fraction of an Ohio veterinary college rather than a complete Indiana veterinary college.

Another plan would be to agitate it as a national problem so that the A. V. M. A. might assume the responsibility of assuring veterinary education to states not providing such. It is my understanding that the A. V. M. A. did attempt to divide the territory among schools and we know that it has no effect.

A veterinary school in Indiana would be a burden out of all proportions to the number of students accommodated or required. It is the most expensive course provided in any school. We have sufficient veterinary schools well established to furnish the whole country if they will accommodate the whole country.

There are several ways that this situation might be relieved and it should be relieved. When support is offered by Purdue I believe we should consider and offer our expression as an association.

In closing, there are other items that I wish to mention. During the past year it has been my pleasure to have the finest co-operation by this Association that any president could ask for. I take particular pride in the way the Committee on the Craig Portrait so efficiently and energetically completed their work. The Program Committee has devoted much time and effort to their task, and we have a fine program for you. The Convention Committee has fulfilled their duty, and we look forward with pleasure to the vast amount of good to be derived from our A. V. M. A. convention in 1941. Let us show our support by gaining as many new members for the A. V. M. A. in the coming year as we can possibly obtain. Your Associations are the bulwark of your profession. That means -- be a part of the whole -- not a parasite hanging on.

I want to thank you all, and wish you all a most enjoyable and profitable convention.

- - - - -

REPORT OF THE COMMITTEE ON PUBLIC RELATIONS AND PUBLICITY

Your Committee on Public Relations begs leave to submit the following report:

"Indiana veterinarians have received more favorable publicity during 1939 than ever in the history of the profession.

"News released by the American Veterinary Medical Association were widely printed all over the State, and with the National Convention coming to Indianapolis in 1941, Hoosier veterinarians can look forward to the greatest publicity of their lives."

A letter sent to the editors of 100 daily newspapers, 200 weekly newspapers and farm journals reads as follows:

"Dear Sir: You are cordially invited to attend the Annual Meeting of the Indiana Veterinary Medical Association, January 9 - 11, 1940, at the Severin Hotel, Indianapolis.

"We urge that you or your representative cover this meeting in order that you may become better acquainted with some of the 600 veterinarians of the State of Indiana, and with some of the problems with which they are confronted.

"It is our desire that you have a closer relationship with the men who are responsible for the health of more than 457,000 horses, 1,633,000 head of cattle, 3,405,000 hogs, 920,000 sheep, 16,029,000 domestic fowl, and an undetermined number of household pets -- livestock valued at $200,000,000.

"The veterinarian is not only the guardian of the livestock industry, but indirectly protects the health of the people against animal disease which are transmissible to man, such as tuberculosis, undulant fever, anthrax, actinomycosis, septic sore throat, cow pox, and trembles in cattle; trichinosis, and erysipelas in swine; glanders in horses; tularemia in rabbits, and rabies in dogs and other animals.

"The inspection of the sanitary conditions of slaughtering establishments licensed by Federal or City authorities, the inspection of all animals so slaughtered, the meat and meat products offered for sale by such establishments, and the inspection of livestock shipped into Indiana from elsewhere, are also among the duties of the veterinarian.

"We have tried to briefly point out to you the important part filled by the veterinarian in the welfare of the community.

"We shall enjoy meeting you at our convention.

"You are permitted to publish this letter or any part, as you may desire, for the information of the readers of your valuable publication.

Yours respectfully,
Public Relations Committee."

District meetings and clinics have received favorable publicity in many sections, but not nearly as much as is possible. Every time that one of you men attend your National, State, or District meeting you should make it a point to get this information to your local paper, along with some comment as to what was accomplished at the particular meeting.

Radio addresses have been made time after time by Indiana veterinarians on veterinary subjects. Talks have become more numerous before civic groups and all of this is mighty fine publicity for the profession as a whole.

The Associated Serum Producers, through the American Foundation for Animal Health, have literally poured veterinary publicity into Indiana during 1939. This has been over the radio, through farm journals, and through newspapers. Surely the practitioner should be grateful for the fine educational program sponsored by this commercial group.

At the same time, we have received a very small amount of publicity that has not been so favorable, such as the Rabies article that appeared in an Indianapolis paper during the last summer. We can be thankful that such articles are in the minority.

Mr. Henry Davis and Mr. Joe Cripe, of the Indianapolis Convention Bureau, deserve the respect and good will of every member of our group. Year after year these men have co-operated with our Association in many ways, and particularly toward getting many articles printed in our behalf. They worked untiringly to bring us the National Convention in 1941.

Signed: Dr. Walter K. York, Dr. R. F. Dean, Dr. J.L.Axby.
(Report Accepted.)

- - - - - -

IN MEMORIAM

DR. E. D. ANDERSON: We have a "Resolution of Respect" which has been formulated by the Board of Directors, which I think was taken up last year, and has been acted upon. It is a resolution of respect in memory of a deceased veterinarian. Arrangements have been made with the Secretary to send this "Resolution of Respect" soon after the demise of all veterinarians.

The following men have passed to the Great Beyond during the past year:

Dr. J. E. Gibson, Indianapolis
Dr. Harley Poyser, Middleberry, Indiana.
Dr. C. W. Grantham, Crawfordsville
Dr. O. W. Snyder, Liberty, Indiana
Dr. Frank E. Ward, Terre Haute
Dr. R. A. Craig, Lafayette, Indiana
Dr. W. B. Massie, Boston, Indiana
Dr. A. M. Drudge, Bremen, Indiana

Let us stand just for a moment in meditation in behalf of the loss of our friends.

(The audience stood in memory of departed members)

- - - - - - - - - -

REPORT OF THE COMMITTEE ON LARGE ANIMAL DISEASE

Your Committee on Large Animal Disease wishes to make the following report:

Equine Encephalomyelitis: Relatively few cases were reported in the state during 1939. Positive findings were made on isolated cases in five different counties. There were thirty-nine (39) cases reported to the Bureau office at Indianapolis. There seemed to be no connection between the different cases reported.

Parasites: Internal parasites in horses cause considerable loss and this condition should be kept in mind when making diagnosis.

Bang's Disease: There has been a decided decrease in the number of herds of cattle under federal supervision for Bang's Disease in the past year. On November 1, 1938 there were 13893 herds with 160,301 cattle under supervision. On November 1, 1939 there were 7252 herds with 92829 cattle under supervision. This reduction is due to the failure on the part of the State Legislature in making appropriations for the state's share of indemnity for reactors. The U. S. Government can make no payment of indemnity unless an equal amount is paid by the state.

Hemorrhagic Septicemia in Cattle: A number of cases were reported during the past year. The virulence of the causative organism was great enough in some cases to cause the death of dairy cattle which had not been weakened by transportation or otherwise. Intestinal complications with respiratory symptoms are noted in some cases. It appears that infected trucks are one way in which a great deal of infection is spread.

Swine Erysipelas: A number of cases were reported in the state during the past year. However, there has been no increase in prevalence of this disease in Indiana during 1949.

Mange in Hogs: Mange is causing considerable trouble, and it is well to keep this condition in mind when diagnosing hog trouble.

Ictero-Anemia in Hogs: This is an anaplasmosis-like condition which appears to be spreading in the state. It has a definite pathology. The cause and the method of spread is unknown.

Swine Dysentery: Swine dysentery was diagnosed extensively in the state during the past year. This is one of the most serious conditions that we have to deal with in hogs.

Swine Pox: This condition sometimes proved a serious complication in hog cholera immunization.

Sheep Scab: Sheep scab was found over more widely scattered area in 1939 than in 1938. During the past year this disease was diagnosed in 44 counties in Indiana.

(Signed) L. E. Andres, R. W. Elrod.

- - - - - - - -

REPORT OF THE SPECIAL A. V. M. A. COMMITTEE

Mr. President and Members of the Association: During the 1939 meeting of this Association, it was unanimously agreed that Indiana extend an invitation to the American Veterinary Medical Association to convene in Indianapolis in 1941.

The President, Dr. D. D. Baker, was ordered to appoint a Special A. V. M. A. Committee, whose duty it would be to extend the invitation at the Memphis meeting of the A. V. M. A.

Pursuant to that order, President Baker appointed said committee composed of myself, Dr. J. L. Kixmiller, and Dr. C. C. Dobson.

Immediately after being notified of our appointments we started to work on this project, all of which work was done in co-operation with the Convention Bureau of Indianapolis and the Conservation Department of the State of Indiana.

We desire to publicly recognize the help, aid and assistance given this Committee by the Convention Bureau and the

Department of Conservation and extend to them our thanks for their help, aid, and assistance.

Immediately after the Committee's arrival at Memphis, headquarters were established and ways and means were devised to endeavor to get a favorable response to the invitation.

Several cities other than Indianapolis extended invitations to the American Veterinary Medical Association for 1941. After all had been heard by the Executive Board of the Association, said Executive Board recommended to the House of Delegates that the American Veterinary Medical Association meet in Indianapolis in 1941.

When this recommendation was presented to the House of Delegates the House unanimously voted for Indianapolis.

As Chairman of the Committee, I want to personally thank Dr. Kixmiller and Dr. Dobson for their splendid co-operation, and also Mr. Henry Davis, Mr. Joseph Cripe, and Mr. Mark Wagoner.

In conclusion, your mandate has been carried out. Your wishes have been complied with.

I trust every member recognizes the magnitude of the preparation for one of these conventions, and that every man will be willing to contribute time, energy and money that we may be adequate to this occasion.

Dr. J. L. Axby, Chairman.

- - - - - - - - - - -

INDIANA REGULATORY WORK

Dr. J. L. Axby, State Veterinarian
Indianapolis, Indiana

GENERAL STATEMENT

The work of the office of State Veterinarian during the last fiscal year relative to disease control was more extensive, intensive and varied than for many years.

This is clearly revealed by the fact that it required the driving of 167,911 miles during the year in controlling contagious and infectious diseases of livestock and poultry, as follows:

Tuberculosis Eradication	75,230 miles
All other Diseases	92,681 "

REPORT

The following report, including a financial statement, will disclose the major activities without going into detailed explanation respectively:

MAIL REPORT

July 1, 1938 to June 20, 1939

Outgoing	Incoming
38,055	20,276

FINANCIAL REPORT

Total appropriation for fiscal year ended June 30 1939	$80,025.00
Total paid out	55,159.99
Reversion to treasury	24,865.01
Reversion from State Veterinary Disposal Plant Fund	1,631.33
Total Reversion	$26,496.34

DISEASE OUTBREAKS INVESTIGATED

Horses	20
Cattle	41
Swine	202
Sheep	199
Poultry	3
Total	465

This is the greatest number of respective disease outbreaks investigated in the history of the Division.

BANG'S DISEASE (Bovine Infectious Abortion)

On October 1, 1929, the Indiana State Live Stock Sanitary Board put into operation what is known as the "Clean Herd Plan" for the control of bovine infectious abortion. This plan is still in operation, and requires a herd to pass four consecutive negative tests at intervals of approximately ninety days. Upon completion of the fourth negative test, the herd owner is issued a clean herd certificate good for one year. An annual negative test renews the herd certificate.

On September 1, 1934, the State of Indiana, in co-operation with the Federal Government, Bureau of Animal Industry, began a co-operative program. This program operated similarly to the State plan, with the exception that testing was done free of charge to the owner, at Government expense, and indemnity was paid by the Government for reactors. When the Federal Government had given a herd the four necessary negative tests, the herd was turned over to this Division of State Government

for certification. This co-operative plan is still in operation, but indemnity was not paid after May 1, 1939.

Up to July 1, 1939, our records reveal 4,481 clean herd certificates for Bang's Disease since the two programs began, an increase of 1,321 over the previous year. These herds comprise 53,181 cattle.

From July 1, 1938, to June 30, 1939, local veterinarians throughout the State of Indiana have abstracted blood samples from 22,841 head of cattle. 2,312 were positive reactors, and 1,568 were suspects with 18,961 negative.

Local testing is regulated by Regulation No. 25 which went into effect June 1, 1937.

Reactors and suspects are automatically quarantined, and reactor tags are placed in the left ears to indicate infection with Bang's Disease. Owners may keep infected cattle under quarantine, or sell them for immediate slaughter, accompanied by a written permit from this Division.

Below is a summary of the Bang's Disease Control and Eradication Program conducted by the Bureau of Animal Industry in co-operation with the State of Indiana, from July 1, 1934, to June 30, 1939:

Agglutination blood tests completed during 58 months:	
Number of herds . . .	56,552
" " cattle . .	697,212
Herds containing infection:	
Number of herds . . .	15,627
" " cattle . .	257,859
Reactors:	
Number of cattle . .	44,870
Negative Herds:	
Number of herds . . .	40,925
" " cattle . .	439,353
Number of cattle under Federal Supervision April 30, 1939:	
Number of herds . . .	13,334
" " cattle . .	153,723
Number of cattle on waiting list April 30, 1939 . . .	None.

All State-owned herds of cattle are supervised regarding Bang's Disease by Inspectors from the State Veterinarian's office. Below is a summary showing Bang's Disease Status of herds owned by the State of Indiana:

Institution	Clean Herd Certificate Number
Indiana State Farm, Greencastle	34
Indiana Sanatorium, Rockville	42
Indiana State Reformatory, Pendleton	100
Logansport State Hospital, Logansport	124
Richmond State Hospital, Richmond	126
Muscatatuck Colony, Butlerville	179
Indiana Epileptic Village, New Castle	183
Madison State Hospital, Madison	276
Evansville State Hospital, Evansville	730
Ft. Wayne State School for the Feeble-minded, Ft. Wayne	1,119
Soldiers' & Sailors' Children's Home, Knightstown	1,688
Indiana Boys' School, Plainfield	2,482
Indiana State Prison, Michigan City	Tested May 19,1939, 80 tested negative.

Below is a summary showing tuberculin status of herds owned by the State of Indiana:

INSTITUTION	LOCATION	DATE OF LAST TEST	NO. OF HEAD	RE-ACTORS
Indiana Farm Colony	Butlerville	9-2-38	91	0
Evansville State Hospital	Evansville	12-3-38	69	0
School for Feebleminded	Ft. Wayne	1-26-39	123	0
Indiana State Farm	Putnamville	11-3-38	134	0
Soldiers' & Sailors' Children's Home	Knightstown	7-13-39	39	0
Logansport State Hosp.	Logansport	6-30-39	185	0
Madison State Hospital	Madison	8-26-38	87	0
Indiana State Prison Farm	Michigan City	1-9-39	90	0
Ind. Village for Epileptics	New Castle	5-26-39	112	1
Indiana Reformatory	Pendleton	3-23-39	141	0
Indiana Boys' School	Plainfield	12-23-38	52	1
State Sanatorium	Rockville	6-1-39	66	0
Richmond State Hosp.	Richmond	6-29-39	91	0
Purdue University (Dairy Herd)	Lafayette	4-7-39	132	0
Purdue University (Beef Herd)	"	4-7-39	190	0
Madison State Hospital*	Madison	1-7-39	44	0

*Heifers out on pasture at the time of regular test, 8-26-38.

BOVINE TUBERCULOSIS

Total cattle tested (all sources)	181,216
Total reactors revealed (all sources)	530
Tested by state and federal forces	102,473

Reactors revealed by state and federal forces 393
Tested by private practitioners (Non-accredited herds) 49,760
Percent of cattle tested by state and federal forces . 56.11%
Percent of cattle tested by private practitioners (accredited and non-accredited herds) 43.89%
Percent of reactors uncovered by state and federal forces 74.15%
Percent of reactors uncovered by private practitioners 25.85%
Accredited herds retested by accredited veterinarians . 1,185
Cattle in accredited herds retested 29,183
Reactors revealed in accredited herds retested 42
Percent of reactors in accredited herds retested 14 of1%
Herds placed under quarantine because of extensive lesions 14
Percentage of reactors of total cattle tested (all sources) .29 of 1%

The following counties had such herds tested as are required under Federal regulations for the purpose of retaining their status as Modified Tuberculosis Free Areas:

County	Herds	Cattle	Reactors	% of Infect.	Remodified
Boone	100	1,074	2	.18%	10-1-38
Brown	53	267	1	.374%	11-1-38
Carroll	184	2,153	0	None	12-1-38
Dearborn	234	1,884	1	.05%	11-1-38
Elkhart	217	2,700	1	.03%	1-3-39
Franklin	123	926	0	None	1-3-39
Greene	118	702	0	"	6-30-38
Henry	450	3,503	4	.11%	11-1-38
Howard	377	2,671	1	.03%	8-1-38
Huntington	69	852	4	.46%	12-1-38
Jasper	576	7,457	20	.26%	3-1-38
Harrison	108	1,128	3	.26%	6-23-38
LaPorte	1,218	15,368	79	.51%	10-1-38
Marion	1,595	10,694	72	.67%	9-1-38
Marion (Retest Infected Herds	25	319	1	.009	9-1-38
Monroe	39	569	0	None	1-3-39
Newton	296	4,557	4	.08%	4-30-38
Owen	127	786	0	None	9-1-38
Rush	225	1,626	3	.18%	6-1-38
Shelby	528	4,095	2	.04%	6-1-38
Spencer	71	861	1	.11%	12-1-38
St. Joseph	639	6,429	12	.18%	9-1-38
Tipton	357	2,837	17	.59%	2-7-39
Tipton (Retest) Infected Herds	8	88	0	(Reduced infection to .45%)	

Vanderburg	96	890	1	.11%	1-3-39
Vigo	176	1,625	0	None	10-1-38
Washington	139	1,043	0	None	9-1-38

RABIES

Total number of counties with rabies outbreaks 66
Total number of positive heads reported to State Lab. . . 406
Total number of counties under State quarantine during yr. 1
Total no. of townships under State quarantine during yr. . 16
Total no. of cities under " " " " 3
Total No. of quarantines issued on individuals owning livestock, dogs and cats 145
Number of rabies outbreaks investigated 9

LIST OF POSITIVE HEADS SENT IN FROM THE 66 COUNTIES

Allen	1
Benton	1
Boone	3
Brown	11
Cass	2
Clark	3
Clay	2
Clinton	4
Crawford	4
Dearborn	6
Decatur	1
Delaware	10
Dubois	1
Elkhart	13
Fayette	14
Fountain	2
Fulton	3
Gibson	2
Greene	9
Hamilton	3
Hancock	2
Harrison	2
Hendricks	9
Howard	3
Jackson	13
Jefferson	6
Jennings	2
Johnson	5
Knox	4
Kosciusko	2
Lake	22
Madison	13
Marion	30
Marshall	2
Martin	3
Miami	1
Monroe	22
Montgomery	5
Morgan	8
Noble	1
Orange	7
Owen	2
Parke	1
Perry	8
Pike	2
Porter	2
Posey	3
Putnam	9
Randolph	2
Ripley	3
St. Joseph	36
Rush	5
Scott	5
Shelby	2
Sullivan	1
Switzerland	1
Tippecanoe	2
Vanderburgh	16
Vermillion	4
Vigo	17
Warren	1
Warrick	7

LaPorte	13	Washington	8
Lawrence	14	Wayne	1
		Total	406

GLANDERS

No Glanders was revealed during the year.

SWINE ERYSIPELAS

Swine Erysipelas was revealed in several counties in central, east central and southwestern parts of the State.

ENCEPHALOMYELITIS

The first case of Encephalomyelitis was reported on August 15, 1938. Subsequent to this date to the first killing frost on or about November 1, 1938, cases were reported from all parts of the State. Approximately 500 cases were reported. An intensive campaign of education was devised, and by regular press releases, letters and mass meetings the live stock industry was kept apprised of all scientific facts and findings, and thus were better able to protect themselves from unscrupulous vendors and advertisers of nostrums.

Early in April, 1939, confirmed diagnoses of Encephalomyelitis were revealed in Vermillion, Fountain, Ripley, Knox, and Monroe Counties. Following the above date until June 30 the disease appeared to have abated.

JOHNE'S DISEASE (Para-Tuberculosis)

Five herds of cattle consisting of 139 head were tested with improved Johnin, revealing 10 reactors.

SCABIES

During the year no scabies in horses was reported. Three herds of cattle were found affected with Cattle Scabies. These were immediately quarantined, dipped under supervision and released from quarantine when found free. The counties involved were Johnson, Lake and Jasper.

CATTLE SCAB REPORT

Number of herds infested with scab	3
" of cattle " " "	283
Number of counties in which infected herds were found	3

LIVER FLUKES

Liver Flukes was reported in four lots of slaughtered

feeder cattle, all of which cattle originated in the west, and were undoubtedly infested upon arrival in Indiana.

SHEEP SCAB REPORT

Number of flocks infested	45
Number of sheep infested	2,325
Number of counties in which infected flocks were found . .	24
Number of flocks twice dipped under supervision	42
Number of sheep twice dipped under supervision	2,265

SALE BARNS

The following is an approximate figure on the number of head of various kinds of live stock sold through auction sale barns and community sales during the last fiscal year:

Cattle	98,000
Swine	174,000
Sheep	10,000
Horses & Mules	2,500
Goats	200

DISPOSAL PLANTS

In conformity with Chapter 278, Acts of the 1937 General Assembly, effective April 1, 1937, the following report is submitted:

Number of plants licensed in 1939 . . .	32
No. of plants with more than 4 trucks .	4
No. of sub-stations	19

There were six less plants licensed for the year 1939 than 1938 accounted for by plants closed for lack of proper equipment to operate in conformity with requirements set out in this Act. All plants licensed in 1940 will have met requirements to establish dry rendering or its equivalent and all trucks hauling such animals will have steel lined beds with rear end elevation of floor to prevent escape or leakage of fluids from carcasses of dead animals.

At this time a great improvement has occurred in all operating plants in Indiana and plants operating under requirements for 1930 and thereafter will improve the present situation.

A report of Receipts and Expenditures is noted in the preceding Financial Report.

INTERSTATE SHIPMENTS

LIVESTOCK SHIPPED OUT OF THE STATE ACCOMPANIED WITH OFFICIAL HEALTH CERTIFICATES

Cattle shipped out of State for dairy and/or breeding purposes . .	1,127
Swine shipped out of State	586
Dogs shipped out of State	84
Sheep shipped out of State	211
Horses shipped out of State	11
Chickens shipped out of State	3
Goats shipped out of State	3
Birds shipped out of State	1

LIVESTOCK SHIPPED INTO STATE ACCOMPANIED WITH OFFICIAL HEALTH CERTIFICATES

Cattle coming into Indiana	5,772
Dogs coming into Indiana	120
Horses coming into Indiana	28
Swine coming into Indiana	2,234
Sheep coming into Indiana	9
Goats coming into Indiana	1
Cats coming into Indiana	1

STATE CLEAN FLOCK PLAN

Season	No. of Hatcheries	No. of Flocks	No. of Birds	No. of Reactors	Percent of Reactors
1931-32	6	164	30,305	1,520	5%
1932-33	32	708	147,130	4,956	3.3%
1933-34	41	845	170,542	6,693	3.9%
1934-35	40	949	187,438	5,752	3.07%
1935-36	48	1,261	264,939	7,039	2.65%
1936-37	55	1,632	329,252	6,630	2.01%
1937-38	43	1,228	248,959	4,843	1.54%
1938-39	45	1,277	262,963	4,881	1.79%

PRIVATE FLOCKS

Season	No. of Hatcheries	No. of Flocks	No. of Birds	No. of Reactors	Percent of Reactors
1931-32		None	None	None	None
1932-33		13	3,301	184	5.5%
1933-34		7	1,619	67	4.0%
1934-35		6	1,906	26	1.3%
1935-36		1	68	6	8.6%
1936-37		2	903	37	4.1%
1937-38		0	None	None	None
1938-39		1	27	2	7.4%

Season	Grade "A" Flocks	Grade "B" Flocks	Grade "C" Flocks
1932-33	4	519	198
1933-34	17	526	309
1934-35	43	653	259
1935-36	56	906	300
1936-37	170	1,204	258
1937-38	179	885	164
1938-39	217	915	146

SHEEP REPORT - July 1, 1937 to June 30, 1938

SHEEP ENTERING INDIANA FROM OTHER STATES ON HEALTH CERTIFICATES

Montana	72,610	
Idaho	5,236	
Wyoming	32,228	
Texas	116,658	
Illinois	4,958	
Oregon	1,159	
South Dakota	1,649	
Colorado	1,818	
Wisconsin	2	
Utah	3,067	
Nebraska	181	
Kansas	6,632	
Ohio	154	
Kentucky	5	
Iowa	123	
Washington	900	
Minnesota	2,130	
Missouri	323	
Total		249,833

SHEEP ENTERING INDIANA FROM PUBLIC STOCK YARDS OUT OF THE STATE

	Dipped	Not Dipped
Fort Worth	323	1,695
Chicago	5,784	6,757
Ogden		1,315
St. Paul		2,599
Nat'l Stock Yards, Illinois		446
Kansas City		4,204
Omaha	1,928	2,276
Sioux City		360
Denver		1,566
Cincinnati	170	278
St. Louis		1,519
Des Moines		300
Total	8,245	23,315

SHEEP FROM PUBLIC STOCK YARDS WITHIN THE STATE OF INDIANA

	Dipped	Not Dipped
Indianapolis	7,472	7,562
Evansville	827	231
Total	9,299	7,793

Total number from stock yards within the State with and without dipping	17,092
Total importation into Indiana	281,393

FEEDER CATTLE REPORT - July 1, 1938 to June 30, 1939

Cows	8,477
Open Heifers . .	32,050
Steers	71,691
Heifer Calves . .	2,909
Bull Calves . . .	1,274
Total .	116,401

ORIGIN OF FEEDER CATTLE RECEIVED FROM PUBLIC STOCK YARDS IN OTHER STATES

Chicago	32,652
Kansas City	37,358
Nat'l Stock Yards, Illinois	9,563
Wichita Stock Yards	1,987
Cincinnati Stock Yards	1,967
Fort Worth, Texas	8,010
So. St. Paul Stock Yards	7,040
Omaha Stock Yards	2,949
Oklahoma City Stock Yards	446
Sioux City Stock Yards	2,315
Denver, Colorado Stock Yards	1,334
Louisville, Kentucky Stock Yards . .	6,508
Miscellaneous Small Stock Yards . .	4,272
Total . . .	116,401

FEEDER CATTLE MOVING FROM PUBLIC STOCK YARDS WITHIN THE STATE

Cows	2,790
Open Heifers	15,338
Steers	28,764
Heifer Calves . .	119
Bull Calves . . .	1,274
Total .	48,283

ORIGIN OF FEEDER CATTLE MOVING FROM PUBLIC STOCK YARDS WITHIN THE STATE

Indianapolis	42,677
Evansville	5,608
Total	48,285

FEEDER SWINE REPORT - July 1, 1938 to June 30, 1939.

Hogs entering the State from other States on permits...	10,994
Hogs handled in public stock yards within the State . .	10,457
Hogs originating from public stock yards located outside of State	7,916
Total . . .	29,367.

- - - - - -

FEDERAL-STATE CO-OPERATIVE LIVESTOCK DISEASE CONTROL

Dr. W. A. Sullivan
Indianapolis

Livestock sanitary authorities have been confronted constantly with important and often perplexing problems. Their responsibilities began to increase with the development of the livestock industry and the expansion of transportation and marketing facilities. For many years it has been customary for such officials to discuss matters of mutual interest, especially the officials of adjacent states. Frequently groups of states were represented at such meetings.

A conference of more than usual significance was held by the U. S. Department of Agriculture on June 19, 1894, to consider the advisability of greater uniformity in State laws regarding infectious and contagious diseases of livestock demanding serious attention. Seventeen delegates were present, representing nine states and the Bureau of Animal Industry. At this meeting an organization was formed under the name of the "National Livestock Sanitary Association" to be composed of Livestock Sanitary Commissioners and their secretaries, the State Veterinarians, and any other State or National official having control of the disease of livestock.

It seems that this organization did not survive and again in October, 1897, the Livestock Sanitary officials of a number of states in tick fever area met at Fort Worth, Texas, with the view of arriving at some understanding, if possible, in regard to uniform regulations to control the movement of cattle from the quarantined area into and through the various states. The results of the deliberations at this meeting were so satisfactory that it was decided to establish a permanent organization and hold such meetings annually. The organization was named "The Interstate Association of Livestock Sanitary Boards."

In 1909 a Constitution and by-laws were adopted, and under the constitution the name was changed to the "United States Livestock Sanitary Association."

The problem of tick eradication led to the establishment of the Inter-State Association of Livestock Sanitary Boards. Its chief aim in the beginning was to bring about uniformity of action by various states in regard to tick fever, but it began early in its existence to extend its scope and usefulness. The first and second meetings were devoted almost entirely to the consideration of tick fever matters. At the third meeting held at Chicago in 1899, bovine tuberculosis became the chief subject for discussion. Hog cholera received special attention at the fourth meeting held in Louisville, Kentucky, in 1900. Infectious abortion, annual parasites and anthrax was discussed with much interest at the fifth meeting in Buffalo, New York, in 1901, and scabies was included in the program the following meeting.

In all livestock disease control work in the United States that has been performed since 1884, the Federal Government has assisted the various states in conquering outbreaks of an infectious or contagious nature. When the time arrived to wage a relentless campaign against animal tuberculosis, Congress provided funds for the Federal Government to co-operate with the respective commonwealths in attacking the common foe. I think it safe to say that in all the co-operative campaigns that have been conducted, the forces have never worked with greater harmony and uniformity than in this campaign. The livestock owners of the country have watched this teamwork and the success that has been obtained up to the present time, and are encouraging its continuation.

I was most greatly pleased upon my assignment to the position of Inspector in Charge of the Indianapolis Office to continue the vast amount of State and Federal co-operative work that has been carried out harmoniously and successfully by the State and Federal Governments in the control and eradication of livestock diseases in the State of Indiana, and in which the practising veterinarians have displayed a great interest and cooperation.

A noteworthy betterment of conditions for the production of domestic animals has occurred during the past few years. There was excellent progress in the eradication and control of important animal diseases. Improvement of livestock by better breeding made further gains. Regulatory work also showed general public compliance with the laws and regulations for protecting and otherwise benefiting the livestock industry.

In these few remarks I feel that I have brought out the fact of the splendid co-operation that has been given to state

and federal authorities by the local practicing veterinarians. I was awfully happy on first noticing a list of the graduate veterinarians residing and practicing in Indiana. It is a fact that this late issue, filed July 15, 1939, which I believe is the latest issue, shows that 646 of the veterinarians on this list (this list containing the names of 753 graduate veterinarians licensed in Indiana) are fully accredited by the U. S. Department of Agriculture, Bureau of Animal Industry, 117 not having been accredited. This shows a very good number of accredited veterinarians in the State of Indiana that are now qualified to test and to retest herds of cattle for creditation and annual re-accreditation testing of accredited herds.

- - - - - -

SMALL ANIMAL PRACTICE

Dr. R. L. Tinkham
Chicago

Small Animal Practice is today occupying the increasing attention of the members of the Veterinary profession. Many men who are doing small animal work are wondering if the large animal work would not be better and the large animal man thinks possibly the small animal practice would be more attractive. I do not see that it makes much difference, each has its advantages and disadvantages. There is no reason why a mixed practice cannot be conducted with profit and satisfaction for it affords diversification and should stimulate interest. I am under the impression that many small animal men have developed a complex, not of inferiority, but as a class of men who are not doing necessary constructive work. One gets such an impression while attending meetings, reading veterinary literature and noting the major objects and accomplishments of the veterinary profession as related to livestock. Possibly there is room for such a thought, but if one stops to consider, their objectives are the same. Both classes of work do promote the health, happiness and well-being of the general public. The large animal man protects the livestock industry to promote these conditions while the man who ministers to the ailments of people's pets is doing the same thing in a more direct manner. Most human endeavor is directed toward these objects, and while some are called luxuries and others necessities, the dividing line is a debatable point.

Well-bred dogs are rapidly increasing in numbers and value, reaching the proportions of a national industry which is well organized and on a sound commercial basis. Millions of dollars are actually invested in dogdom and its associated interests.

Dog shows are increasing each year, drawing wonderful support from an interested public. Supplies, foods, kennels, etc., are important sources of work and profits. Dogs are an important economic force in America today. There are between fifteen and eighteen million dogs in this country, or about one for every fifth home. The dog industry is rated at close to a half a billion dollars.

The annual dog food consumption amounts to $60,000,000. Canned dog food amounts to some $50,000,000. Dry dog food represents another $10,000,000. Canned dog food sales is surpassed only by canned milk in volume of sales in canned foods. Close to $20,000,000 is invested in animal hospitals. There are about 2,500 remedies sold for the exclusive use of the dog. At least $3,000,000 a year is spent for canine accessories. A total of $15,000,000 is paid for the purchase of new puppies. Dog owners are taxed each year, for having a dog, to the extent of $25,000,000. Railroads and other travel agencies derive a total annual income of about $25,000,000 as fares for dogs going to and from dog shows, for breeding purposes, and being transferred to new homes. Several hundred million dollars is permanently invested in dog food and remedy factories, kennel buildings, etc. Seventy thousands of people are employed in the dog business; twenty thousands derive part of their income from dogs. The farmer profits greatly from the sale of meat on the hoof and grain grown on the farm, for the manufacture of dog food. The increased sale of dog food has resulted in the overcoming of the farmer's losses resulting from the decreased use of the horse which formerly consumed several acres of grain.

The American Kennel Club divides dogs into six classifications for the purpose of showing -- Sporting dogs, Sporting Dogs (Hounds), Working Dogs, Terriers, Toys, and Non-Sporting Dogs. Dogs may be classified by size -- from the toy dogs such as the Chihuahua weighing but a few pounds to the giant dogs as the St. Bernard weighing over 200 pounds. Only about 2,000,000 of the American dog population are purebred dogs and registered. The American Kennel Club recognizes 107 breeds. There are approximately 225 pure breeds of dogs throughout the world.

The entry into small animal work is an easy matter but it is well to give it thoughtful consideration. The matter of location, hospital facilities and equipment may determine success or failure. We all have the basic knowledge to prepare us for the many different fields of veterinary work, but special effort and study must be undertaken to qualify for special work. Dogdom is a world of its own, inhabited by doggy people who

expect their veterinarian to know all about dogs as well as the technical side of his work, and I can assure you that it is well worth while to study the dog industry in all its branches. It pays to study the various standards by which dogs are judged, to know the many breeds and their peculiarities, both normal and abnormal.

The most important qualification a small animal practitioner can have, to assure success in practice, is tolerance and sympathy which in turn dictates tact and diplomacy so necessary to inspire confidence and co-operation. Whether or not the patient is treated at home or in a hospital, limits or inhibitions are often placed upon the doctor who then is placed in the position of doing the best he can under the circumstances. Owners have peculiar ideas. Hypodermics of any kind may not be in favor. Some do not believe pills are of any account so must have liquid medicines and vice versa. Others suspect surgery, etc. A practitioner must accommodate himself to these various conditions since he cannot change people; in fact, he himself does not change his own convictions very much. The owner must be satisfied that his pet is in intelligent, sympathetic hands.

We do not always have proper opportunities to make careful detailed examinations on account of impatient owners or the expense connected with confirmatory procedure. Consider the predicament when an owner, although very anxious about his pet, informs you that they have a cab waiting, expects an immediate decision and medicine to cure him and does not expect to make any return calls. With patience and tact, such owners may be made to see the light, but it does emphasize the fact that the owner is more of a problem than the patient. Nevertheless, in every instance we must try to succeed in satisfying those who come to us. Impatience, sharp words, sarcasm or exhibitions of temper are never permissible. Tolerance and sympathy still hold good for such an attitude does characterize the practitioner as one of intelligence and understanding.

This same attitude applied to our consideration of the patients themselves, will do much to impress the owner, make the handling, restraint and necessary examinations an agreeable task instead of a source of hostilities and unprofessional behavior. Our patients are very nervous, emotional, easily disturbed to such an extent that the true clinical picture and symptomatology is quite different from what it might have been.

Diagnosis in every case is our chief concern and it behooves us to take advantage of everything that will aid in getting a true picture of the case. Every case that is brought to

us is important, deserving our very special attention, for each presents a possible nucleus of new friends and expanding practice. It is a fallacy to reserve our special best on the so-called very special cases.

It is well to begin the examination of the dog before he is put upon the examination table, preferably while he is on the floor or still in the hands of the owner. Much can be learned at this time of both the owner and the dog. The owner will state his wants and his impressions and if not sufficient history is given a few questions will usually get enough preliminary information and often a diagnosis of special conditions is arrived at immediately. In making our routine examination, it becomes a habit to follow certain procedures so that after first impressions one can attempt to classify the trouble. It is well in nearly all diseases to take temperatures and while so doing additional time is had to closely observe symptoms as they appear while the patient is on the table.

To the practitioner diseases are largely divided into two main classifications in his early examination, and I think of them as catarrhal fevers for one and gastro-intestinal disturbances for the other. I use the old term catarrhal fevers because it seems to cover the class of infectious diseases so well.

We cannot lay down a rigid rule in classifications of any of the diseases since so many are recognized of bacterial origin but the practitioner must gradually arrive at a conclusion by identification of positive evidence. An elevation of temperature usually means an infection. The history will determine if it is contagious and the detailed examination will locate the principal area or organ that is affected. These infections may be acute, semi-acute or chronic, and in the ordinary cases are not hard to locate or identify.

Our most common catarrhal infection in the dog is distemper but we must be careful in the diagnosis of distemper, because not every case of running nose and sore throat means distemper. I do not believe it is possible for any man to differentiate distemper in its secondary stages from many of the catarrhal infections in the dog. Possibly the old term distemper did cover all of those infections, but our presentday virus distemper has a definite entity of its own. It is true that dogs have plain colds, and they usually cause a greater systemic reaction than in man, with an elevation of temperature and are more or less serious conditions; exposure to the weather, carelessness after a bath with soap, during the heat period in females, etc., are

the most frequent causes of these colds.

Gastro-intestinal disturbances will also have a number of objective symptoms which classify these troubles for us. There are, of course, a host of other troubles, some of which do fall into regular classifications and others which may be called special conditions from the clinician's viewpoint. A few of these can be mentioned, such as diseases of the skin, nervous system, circulatory disturbances and diseases of the bones, but it is understood that most diseases are closely associated with and interdependent in their symptomatology and constitutional influences.

In attempting to establish a diagnosis, the obvious cases are, of course, easy, although their pathology may be most obscure, but in more complex conditions, it behooves us, now, after our preliminary impressions, to localize the exact seat of the trouble. In the infectious conditions this may be easier to do than in other functional or structural disturbances, although even a plain infection of the tonsil may be a pitfall for a careful practitioner. With care and practice one does become proficient in finding the original seat of trouble, and in tracing the effects of these primary infections. One must recognize that an active virulent infection may cause serious disturbances regardless of location.

Distemper in dogs and cats being the practitioner's greatest source of headaches, challenges our ingenuity as practitioners. This disease is so common and so often fatal, that I do think it is the most unsatisfactory problem that the ordinary man has to deal with. The results are usually unsatisfactory. The owner is invariably discouraged and dissatisfied. The patient requires an enormous amount of care, the course of the disease so long, that neither the owner nor the doctor can afford to give him the proper attention. Hospitalization of distemper cases, in my opinion, is most unsatisfactory. These cases jeopardize the health of every other dog in the hospital, the attendants find it difficult to care for them, the attending intestinal disturbance makes them unclean, and the expense is considerable while the results are usually discouraging. In the last several years the nervous form of distemper has been very common making the prognosis still more unfavorable.

In the treatment of distemper, I have nothing new to offer. Serum in the initial stage seems of some value. Bacterins have been disappointing and other than good care and nursing, with some supporting treatment, I cannot truthfully say that much has been accomplished as far as treatment is concerned.

In the other catarrhal infections, including pneumonia, no satisfactory drugs have been found and the symptomatic supportive treatment seems to be much the same as always. It is possible that chemistry will some day supply us with an agent that we can depend upon to destroy these various infections, but so far it has been rather disappointing.

Gastro-intestinal troubles are in the majority in most small animal practices. The apparently simple case of vomiting is very common in the dog and often means nothing more than unwise eating or a functional let-down of the stomach or anterior bowel. Severe vomiting over a period of several hours followed by rapid recovery, is often difficult to explain, but must be accepted as a distressing functional derangement. In these alkalies are usually given, but often an acid solution gives better results. An enema may be of benefit although constipation is not present. The onset of fever may cause vomiting while septic conditions invariably produce nausea. In all these cases one must be on guard against intestinal obstructions or foreign bodies lodged anywhere along the canal. In the stomach such bodies are not easily determined, palpation being difficult, and here the X-ray is very useful. Intestinal obstructions are revealed by palpation. Tumors, constrictions, dilatations, etc. must be investigated with extreme care. Simple obstructions are common in the dog and may consist of fecal accumulations or one of the many objects a dog may swallow. An enema may move it along, an opiate may reduce the spastic bowel, but often a laparotomy must be resorted to. If discovered early enough, in two or three days, a simple opening in the intestinal wall is followed by rapid recovery but should enough tissue degeneration be present, a section must be removed; however, the intestinal wall can be quite dark in color before the simple operation need be abandoned. It is often possible to move the obstruction along to a healthy section before making the incision.

Loose stools, diarrhea or dysentery should be traced to their origin and since patients are often brought in for this one condition, it may tax our best efforts to locate its cause. Consider the diet, special sensitizations, excitement, as well as a host of other conditions which may cause this symptom.

The disease commonly called typhus is still, I think, somewhat of a mystery. In any of its forms or stages, it does not respond very well to the vitamin, nicotinic acid, liver and mineral treatment.

Detailed information on the technical problems of our work can be obtained from textbooks, althought most of us do not refer

to them as we should. New developments are constantly discussed in the special articles which appear in the excellent magazines we should have on our desks. There should never be a time in all the years that we practice that the new developments and latest information does not get our attention and consideration.

The small animal practitioner works hard, has long hours, needs and tries to please many people, charges small fees, is a slave to the telephone and should be glad to get away for a few days to attend the State Meeting.

- - - - - - - -

IMPORTANT POULTRY DISEASE PROBLEMS FACING THE PRACTITIONER

C. A. Brandly
Senior Pathologist, U. S. Regional Poultry Research Laboratory
East Lansing, Michigan.

In the last quarter century America's poultry industry has arisen from the position of a minor venture in agriculture to a rank among the leading farm industries, being surpassed usually only by dairying and corn. Figures for the ten-year period, 1926 to 1935, which includes peaks of high and low prices, show a gross return to farmers from poultry and eggs of approximately a billion dollars a year.

The remarkable developments which raised poultry to the stature of big business were beset at each step by numerous pitfalls and hazards. Lack of knowledge of the problems of large-scale incubation and of the hazards of extensive traffic in baby chicks and breeding stock, as well as inadequate information on feeding and management factors were among the major pitfalls. This circumstance actually favored the spread and perpetuation of infectious and parasitic diseases and increased the toll taken by disorders arising from improper management and nutrition. Increased attention to the ills of poultry was a natural consequence of the growing importance of the industry. Scientific research in various directions during the present century has yielded valuable information, the application of which has served to curtail and ameliorate much of the loss from disease. But while embryo and chick losses have been greatly reduced the mortality problem in adult poultry, particularly chickens, has increased to tremendous proportions. Current reports reveal an annual adult mortality in excess of 50% in many high-grade farm and commercial flocks. Some estimates place the figure of this loss in the United States at $50,000,000 a year. Obviously some of these losses are preventable by the application of newer to them as we should. New developments are constantly discussed in the special articles which appear in the excellent magazines we should have on our desks. There should never be a time in all the years that we practice that the new developments and latest information does not get our attention and consideration.

The small animal practitioner works hard, has long hours, needs and tries to please many people, charges small fees, is a slave to the telephone and should be glad to get away for a few days to attend the State Meeting.

- - - - - - -

IMPORTANT POULTRY DISEASE PROBLEMS FACING THE PRACTITIONER

C. A. Brandly
Senior Pathologist, U. S. Regional Poultry Research Laboratory
East Lansing, Michigan.

In the last quarter century America's poultry industry has arisen from the position of a minor venture in agriculture to a rank among the leading farm industries, being surpassed usually only by dairying and corn. Figures for the ten-year period, 1926 to 1935, which includes peaks of high and low prices, show a gross return to farmers from poultry and eggs of approximately a billion dollars a year.

The remarkable developments which raised poultry to the stature of big business were beset at each step by numerous pitfalls and hazards. Lack of knowledge of the problems of large-scale incubation and of the hazards of extensive traffic in baby chicks and breeding stock, as well as inadequate information on feeding and management factors were among the major pitfalls. This circumstance actually favored the spread and perpetuation of infectious and parasitic diseases and increased the toll taken by disorders arising from improper management and nutrition. Increased attention to the ills of poultry was a natural consequence of the growing importance of the industry. Scientific research in various directions during the present century has yielded valuable information, the application of which has served to curtail and ameliorate much of the loss from disease. But while embryo and chick losses have been greatly reduced the mortality problem in adult poultry, particularly chickens, has increased to tremendous proportions. Current reports reveal an annual adult mortality in excess of 30% in many high-grade farm and commercial flocks. Some estimates place the figure of this loss in the United States at $50,000,000 a year. Obviously some of those losses are preventable by the application of newer findings and observations, but the cause and control of others remain to be determined. Such major problems as fowl paralysis and related maladies will demand much future work for a satisfactory attack against them.

The Status of the Practitioner in Poultry Disease Control

Numerous reasons may be cited why the practitioner does not occupy as important a position in the furtherance of disease control in poultry as he does in the work against disease in other livestock. An analysis of some of these reasons would seem justified in order somewhat to clarify the attitude and responsibility of the veterinarian, as well as the poultryman in the present situation.

The fact that the practitioner has frequently shown little or no interest in poultry practice has been attributed to lack of familiarity with poultry husbandry and poultry disease problems. However, his knowledge and interest in this direction may be increased and augmented by attendance at "continuation" and "refresher" courses, and by study of many good bulletins and articles on poultry pathology. Fortunately there are sufficient licensed veterinary practitioners who, if informed on poultry-disease diagnosis and control, can fill the demand for this service and thus aid the poultry industry in a most distressing problem.

The claim that poultry practice as a separate item is not profitable may be true in part. Nevertheless many practitioners have found that reasonable effort in the direction of providing creditable service for the poultryman in his disease problems has yielded a nice return. By study of the specific aspects of poultry disease control, the scope of the practitioner's knowledge and interest may be widened and many mutually beneficial contacts established. Practitioners who have specialized in poultry practice have learned that the demand for veterinary service has increased as the quality of such service has been augmented and improved. A significant point in increasing the demand for skilled veterinary service in poultry has been the education of flock owners to the realization that effective control of disease demands a substantial long-time program based on scientifically established facts and principles. In many localities the practitioner can do more than any other individual or agency to emphasize the need and value of such a suitably planned and directed program for maintaining the health of poultry.

The present tendency is to think of the farm poultry flock as an animal unit comparable, according to size and value, to one

or more good horses or cattle. On this basis, the poultryman will usually justify the need for capable veterinary assistance if it is available. The attitude that such service is an expense rather than an investment will change also when its superiority over so-called "remedies" and the advice of untrained persons is recognized.

The purchaser of baby chicks who experiences difficulty with them frequently - and quite logically - returns to the hatcheryman for help - and compensation. The hatcheryman of necessity gives the best advice at his command and may feel justified in recommending and even supplying "remedies". This situation may be greatly alleviated by efforts on the part of the practitioner to become truly "poultryminded". Many hatcherymen and feed men, as well as poultry producers, would no doubt turn for relief to the veterinarian if they could be assured of his interest and qualifications.

DIAGNOSIS

Currently new diseases and problems are appearing among poultry. Yet a knowledge of the diagnostic features of the important "established" diseases is invaluable to the practitioner. Observation of the flock and premises should never be overlooked in making specific recommendations for sanitation and the exclusion of possible infection or parasites from the outside. Flock inspection at regular intervals is likewise fundamental to any health maintenance program. Observation of diseased flocks, together with careful thorough post-mortem examinations of a representative number of suitable specimens is essential for diagnosis and the institution of proper procedures. Even though such a step may not yield a positive diagnosis, it will often point to tentative control measures to be adopted and also give important clues in the event specimens must be sent to a laboratory for differential diagnosis. The assistance of a laboratory is often indispensable to the practitioner. Several respiratory diseases, including infectious bronchitis, laryngotracheitis and coryza, may sometimes be indistinguishable except on an immunological basis - this latter being strictly a laboratory procedure. The desirability of submitting for laboratory study such cases which show "new" or apparently atypical lesions or manifestations frequently serves to improve the practitioner's diagnostic capacities. Poultry practice offers the distinct advantage of providing not only more specimens for autopsy but usually specimens which are much more desirable for such examination than in the case of other livestock. Special avian autopsy instruments are a time and patience saving addition to the practitioner's equipment. A microscope is certainly a necessity. With the aid of this instrument diagnoses on questionable cases

of tuberculosis, of intestinal parasitism, of coccidiosis and of blood alterations may be completed in the practitioner's own laboratory. Here it may also be stressed that the veterinarian should expect to serve chiefly as a diagnostician and adviser, not as a "nurse" to the flock.

Vaccination and Medication

The greatest advances in the control of infectious and parasitic diseases of poultry must be placed on environmental sanitation. In comparison, the increase of resistance by vaccination has played quite a minor role.

With the possible exception of the autogenous bacterins, fowl pox and laryngotracheitis vaccines are the only biologics which may be depended upon to give a satisfactory active immunity to the respective diseases. These vaccines in the form of active viruses possess the inherent shortcomings of true vaccines in that the virulent agent is introduced and infection is set up in the flock, unit or herd. Unless a very high percentage of "takes" is obtained, post-vaccination, contact infections may take place or part of the flock may remain susceptible. Carriers may be established in consequence of vaccination particularly if the procedure is not entirely successful. Naturally high susceptibility of individuals, as well as devitalizing factors such as intercurrent parasitism or infection may cause severe vaccination or inoculation disease with serious sequellae. In the use of fowl pox virus for vaccination, careful consideration must be given to age, condition, health, and management of the stock. Vaccination with fowl pox virus in baby chicks, as well as mature birds and birds in production, is contraindicated because of danger of a marked constitutional reaction. In these birds, as well as in other stock not in prime health, vaccination with pigeon pox virus by the multiple feather follicle method is recommended. The reaction to pigeon virus is not generalized but the immunity is far less profound and durable.

In the past, good results have been reported from the use of autogenous laryngotracheitis vaccine. By detecting the outbreak during its earliest stages, vaccination with a product prepared on the premises from affected birds has served to greatly curtail losses.

The poultry industry has been the victim of gross exploitation in the field of alleged medicinal and therapeutic practices. The veterinarian is in a position to point out the fallacies and shortcomings of the many so-called remedies and cures. Practices such as the common use of soda and of frequent and protracted milk "flushing" are examples of misunderstood and mis-

directed procedures which may do much harm. Only upon rational measures of true scientific merit may the foundation of a successful practice and relation to the poultry industry be built.

Sanitation

An appreciation of the necessity of a sound sanitary program on the average midwestern farm usually requires a considerable effort in education. Teaching by demonstration of the value of a definite program in a given flock or flocks within a community has proved a most effective method. A demonstration flock, however, need not and cannot serve as a public visiting place since strict quarantine is an essential part of sanitation.

In selecting a flock for demonstration particular attention must be given to soil type, natural drainage and topography, as well as to desirable houses and equipment and range facilities. Essential improvement and partial or even complete relocation of the poultry plant may often be accomplished to great advantage. The provision of artificial drainage and correction of excess shading may overcome an undesirable environment where relocation of the plant is not possible. The necessity of keeping chicks separate from mature stock and away from the ranges and houses used for the latter cannot be neglected as a fundamental measure. Likewise, the hazards of allowing various species of poultry to intermingle may demand emphasis. Only by limiting each species of poultry to definite areas and houses set aside for their use can a sanitary program be successful. In the first place, poultry sanitation cannot be maintained over the entire farmyard or premises. Conveniently located areas for rotation of runs and ranges are thus not available and birds running at large may harbor and disseminate, as well as contract, certain diseases from other species. The best example of the value of simple sanitary measures is illustrated in the ease with which blackhead may be controlled. Here control measures are based largely on keeping chickens apart from turkeys and changing the range to a fresh area at intervals of one to two weeks.

Nutrition

Rapid strides have been made in the knowledge of the nutritional requirements of poultry, yet it is evident that such knowledge is far from complete. New findings as to what constitutes an optimum ration have resulted in frequent changes during recent years.

The composition of our feedstuffs is not constant. The locality and environment influence the percentage composition of essential elements and compounds and also the presence or

absence of toxic agents as, e. g., selenium in grains. Thus it becomes as important to know the possible deficiencies which may occur in the various constituents as it is to be aware of the composition of the feed in the form of carbohydrates, proteins, vitamins, etc.

The frank expressions of such nutritional diseases as rickets, A-avitaminosis and perosis are seldom difficult to recognize, but the occurrence and detection of marginal or sub-clinical deficiencies represent a real problem. Only by becoming thoroughly familiar with the facts of feeding poultry may the practitioner provide worthwhile assistance in this field.

Summary

The current problems of poultry disease offer a direct challenge and responsibility to the veterinary profession. The control of poultry disease is no less a province of the veterinarian than the control of disease in other animals. The practitioner can fulfill his obligation to the community only by becoming entirely familiar with the problems confronting him. As a means of developing and fortifying this knowledge, actual instruction gained by attendance at "continuation" and "refresher" courses may be supplemented by reading available literature pertaining to the poultry industry and its disease problems.

As sanitation is the foundation for maintenance of health so is correct diagnosis the substructure for early and effective control measures. Poultry sanitation and disease diagnosis demand a sound scientific background, together with specialized knowledge in this field. New findings in the nutrition of poultry are clarifying this important problem particularly as regards its relation to infectious and parasitic disease.

The practitioner must exercise extreme care and judgment in advising the use of biologic products and in the medication of poultry. To include anything but rational procedures proved of value by rigid experimental criteria will tend to destroy confidence in his ability to meet creditably the responsibilities in this field.

- - - - - - - - - -

SOME COMMON CONDITIONS MET IN DAIRY PRACTICE

Dr. Herbert Lothe
Waukesha, Wisconsin

In presenting this discussion on dairy cattle practice, I harbor no delusions that what I may say is authoritative or that the subject will be exhaustively discussed. A discussion in the short time allotted must necessarily be sketchy. Neither have I any delusions that pathological change in the dairy cow differs from that in bovine animals used for purposes other than the production of milk; the basic pathology is the same, but the demands man makes of the dairy cow predispose her to certain disorders that, while they do occur in the beef animals, occur more frequently and are of greater economic importance to the dairyman than similar disorders would be to the producer of beef. In other words, each class has what we might term "occupational diseases".

To qualify as a dairy cow the animal must possess a capacity for consuming large quantities of food and convert it into milk. Milk production is intimately connected with the phenomenon of reproduction. It follows, therefore, that disorders affecting the digestive, milk secretory and reproductive functions are of primary importance in dairy practice and probably the greater part of a dairy practice is concerned with disorders of these functions. Other disorders, diagnosable and otherwise, occur with regularity but are less frequent and of lesser economic importance. I shall discuss briefly some conditions affecting these functions, devoting myself largely to treatment rather than etiology and pathology.

Digestive Disorders.

1. Acute Indigestion:

This condition is dietetic in origin. Of the causes, overfeeding is by far the most frequent. Animals being forced for high milk production (advanced registry testing, etc.) are especially apt to be fed beyond their capacity, the novice being especially prone to commit this error even though feeds fed are of the best quality. The feeding of large quantities of grain concentrates without beet pulp or beets as a supplement is highly predisposing to indigestion. Eating of damaged foods (frozen, rotten, moldy silage, coarse woody hay), changes of feed (pasture to dry feeding, overeating in grain bin or of green clover or alfalfa) are causes.

Treatment varies with severity of attack. When accompanied by severe bloating (alfalfa, clover bloat) the trochar

is life-saving and often all that is necessary except correction of the diet (keep animals off alfalfa and clover pastures). I know of no safe way of pasturing these crops; a fill of dry hay before turning to pasture helps but often fails to prevent the bloating. If these crops must be pastured the animals should be watched and left to graze for only a short time. Those overfed with high quality feed (test cows, etc.) should receive a cathartic (epsom salts, one pound, or raw linseed oil, one quart). This is to be followed by barium chloride, 60 grs.; tartar emetic, 60 grs.; extract of ginger, 20 grs.; and strychnine sulphate, 1 gr., every six hours for three doses. This is to be followed by 20 grs. ext. nux vomica every 6 hours. Drinking of water should be encouraged and food allowed sparingly when appetite returns. Appetizers such as ginger and capsicum are of value as "follow-up" treatment. In excessive impactions where the content of the rumen is dry with some tympany the passage of the stomach tube and pumping into the rumen of 2 to 3 pailfuls of warm water is often beneficial. The extra large stomach tube is often of value in cases where animal has gorged at a grain bin.

2. Traumatic Indigestion:

This condition, as you know, is caused by sharp foreign bodies (wire, nails) piercing the stomach, leading to peritonitis, pericarditis, etc. At the onset it is often impossible to differentiate from primary indigestion and a diagnosis of primary indigestion is made. At best, the diagnosis of traumatic indigestion is often a shrewd guess and frequently erroneous. Loss of appetite with scanty bowel movements in a cow on pasture, without a history of overloading on food, is highly suggestive of traumatic indigestion (primary indigestion is rare in pastured cattle but common in stable-fed animals). History of previous attacks of indigestion, unthriftiness, increased pulse (80 or higher) with elevation of temperature (104 or higher) are highly suggestive of this condition. Failure of response to the usual line of treatment in three to four days is also suggestive of traumatic indigestion.

The success of treatment will depend largely upon the course the foreign body takes; if the pericardium is pierced the outcome is eventual death as is also the case where generalized peritonitis results. Our hope lies in the development of a circumscribed peritonitis (peritonitis with adhesions and walling off of the body) which may result in complete or partial recovery (subsequent attacks, loss of condition). Medicinal treatment should consist in administration of non-irritant cathartics such as mineral oil (2 quarts daily) together with

stimulants rather than such irritant cathartics as epsom salts, barium chloride and tartar emetic that may cause irritation and depletion of the patient. I have never employed operative treatment (rumenotomy with removal of the body) for the reason that early diagnosis is difficult and the cattle owner is not inclined to look with favor on such a procedure. He would rather chance salvaging at the stock yards, located only a few miles away, than resort to an operation. Salvaging the animals is not as spectacular from the veterinary point of view as rumenotomy, but cattle owners will be economic-minded.

3. Acetonemia:

While acetonemia is not primarily digestive in origin, one of its most prominent symptoms is deranged appetite, so I have grouped it with digestive disorders. Gradual loss of appetite, diminishing milk flow, rapid loss of condition with nervous symptoms (dullness, excitement, convulsions, spasms, paresis) one to two weeks after a normal calving are highly suggestive of this condition. The application of the ketone test to a urine sample will clinch the diagnosis. Acetonemia frequently complicates milk fever.

Treatment consists in intravenous administration of 250 c.c of 50% dextrose followed by corn syrup or molasses (1 pint 3 times daily) on feed or as a drench if animal will not take it voluntarily. Chloral hydrate (2 ozs. in capsule followed by two doses of 1 ounce in pint of water at 6-hour intervals) is of value in those cases showing nervous symptoms. Intravenous administration of 250 c. c. of a solution of 50% dextrose and 5% chloral hydrate has given good results in cases showing nervous irritability, recovery being spectacular in some instances. Intravenous dextrose treatment may need be repeated in stubborn cases, especially in those patients that will not take sugars voluntarily. Most cases recover.

4. Winter Diarrhea:

Winter dysentery is a diarrhea of stabled cattle occurring in winter or early spring. After the appearance of the first case others appear in rapid succession until all or most all animals in the herd have shown symptoms; calves may also contract the disease. The course from a few days to a week usually ending in complete recovery, although deaths occasionally occur. The disease is of economic importance because of diminished milk flow during the progress of the disease through the herd. Preventive treatment is unknown and treatment is symptomatic. In testinal antiseptics and astringents such as catachu, krameria,

iron sulphate are of value.

5. Calf Scours:

Dysentery in calves may be dietetic or infectious in origin Faulty feeding is often the forerunner of infectious scours. The first three days of the calf's life are critical ones; overloading with milk during these days may lay the groundwork for an attack of infectious scours. Once an infection gains virulence it spreads to the sick animal's associates like an epidemic. Occasionally intra-uterine infection plays a part for animals sicken and die in such short time following birth (12 to 24 hours) that its inception can be explained only on the basis of being prenatal.

Prevention is of primary importance; every effort should be made to prevent the individual from coming in contact with infection and maintain resistance up to par by proper diet and environment (clean maternity stalls, dry pens of uniform temperature, free from drafts). The feeding methods recommended by Udall are effective.

The calf should be born in a clean stall and receive colostrum milk as soon as possible and left with its mother for 12 hours after which it is removed from its mother and all food withheld for twenty-four hours. On the third day (36 hours after birth) regular feeding begins by allowing of its dam's milk 6% of the calf's body weight in milk per day, pail fed in sterile pail three times daily. A daily increase of 8 ozs. up to three weeks of age is allowed. Wire muzzles are to be worn continuously, except at feeding time, for the first thirty days of life, are of value in preventing ingestion of indigestible material (straw, shavings, etc.) that may bring on indigestion and infection. At ten days skim milk may be added gradually, increasing the amount until skim milk constitutes the whole milk ration. Grain (ground oats) and hay should be allowed at one month of age. Where the calf mortality has been high and value warrants it, a prophylactic dose of calf scour serum (20 to 30 c. c.) or 100 c. c. of the dam's blood administered subcutaneously immediately after birth is advisable and often spells the difference between a live and dead calf.

When scours is already present all milk should be withheld, a high enema given (rubber horse catheter and douche-can). Bismuth subnitrate (20 grains twice daily) aids in checking the scours. All milk should be withheld until scours are checked; if milk is not tolerated, eggs will often support life as well

as corn syrup for food until bowels become normal. Stimulants such as aromatic spirits of ammonia (2 to 4 drams in half pint of water containing 1 ounce bicarbonate of soda) are helpful.

In large breeding establishments calf scours may become a veritable scourge. In such instances extreme measures may be necessary such as cultural examination with preparation of autogenous bacterins or even special immune sera. The services of an experienced calf man will often bring these epidemics to a halt with the use of a minimum of biologics.

Udder Disorders:

1. Teat injuries:

(Wounds, strictures and obstructions of the teat canal) are common in dairy cows because the size of the milk-producing organs make them especially liable to injury (treads by cow herself or by stable mates). The treatment is surgical; antiseptic treatment of wounds with trimming of ragged edges and application of ointments to keep tissues soft and facilitate milking; strictures and obstructions are handled by the use of teat bistouries. Milk tubes and teat dilators (wax or otherwise) have not proven satisfactory in my experience as they eventually lead to an infected quarter.

2. Mastitis:

Mastitis as you can readily realize is a serious condition as it strikes at the source of the dairyman's income, the udder. It is primarily chronic in nature with repeated acute manifestations rather than an acute condition that tends to become chronic. The etiological factor is infection, our bacteriologists tell us. As in all infections, the infected animal will spread the infection to others and there is clinical evidence to show that mastitis can and is slowly spread through a herd by the act of milking. The milking of affected animals last is good practice and productive of results. Badly diseased animals should be eliminated from the herd.

While infection is the immediate cause of mastitis there are predisposing factors that are even of as much importance as the infection itself for these factors lower individual tissue resistance allowing infection to develop that would not if resistance were high. Faulty barn construction (stalls too narrow or too short so udder or teats become injured) inadequate bedding, injudicious use of milking machine (too high vacuum, left on too long, infected teat cups, improper stripping), rough manipulation

during milking and failure to milk quarters dry are predisposing factors. High protein feed probably does not cause mastitis but heavy feeding often aggravates an already infected quarter (brings on an acute attack). Mastitis is present in both Bang negative and Bang positive cows and control of Bang's disease will not eliminate mastitis from the herd.

The use of the brom-thymol test is of value in detecting infected animals and helps prevent spread by early detection.

Treatment:

An affected quarter probably never or rarely completely recovers, although the acute manifestations subside with repeated attacks of common occurrence. Frequent milking (every hour), hot applications, withdraw all grain and the administration of a cathartic are beneficial. There is some indication that sulfanilimide (120 grains 4 times daily) is beneficial. Bacterins may be helpful. Stimulating liniments after acute pain subsides are beneficial to hasten absorption.

Reproductive Disorders:

Reproductive disorders are many and varied, the most commonly met being failure to conceive or failure to produce viable offspring after conception.

1. Failure to Conceive:

Failure to conceive may be manifested by absence of estrum, too frequent, continuous or irregular estrum, or by regular estrum. Familiarity with the feel of a normal genital tract by rectal palpation is essential to diagnosis of conditions leading to estral irregularities.

Absence of estrum may be due to a retained corpus luteum, either with pregnancy (from an unobserved or unrecorded service), or a mummified fetus or pyometria (post partum or trichomonad). Retained corpus luteum without pregnancy is not uncommon. The dislodgment of the corpus luteum is indicated in each of these conditions except in case of pregnancy unless you desire to produce an abortion. The removal of the corpus luteum causes expulsion of the uterine content and appearance of estrum in a few days (3 to 6). If genital tract appears normal (no discharge) at second estrum animal may be bred. This procedure is followed by conception in a large percentage of cases.

Absence of estrum without a retained corpus luteum commonly occurs, especially in animals on a starvation diet and in some

endocrine upsets. Little can be done except proper rations; hormone therapy holds promise but we know too little about our hormones to know what and when they are indicated. Too frequent or continuous estrum is always associated with cystic degeneration of the ovary. Treatment consists in rupture of the cysts per rectum. Repeated treatments are often necessary and unless animal has unusual value, treatment is not economically profitable (grade cows).

Regular estrum with failure to conceive may be due to use of infertile bulls or to certain conditions affecting the female genital tract. Cervicitis and salpingitis may be causes. Treatment is surgical, douching of cervical canal with iodine solution, and surgical removal of diseased cervical rings if they are present. Conception follows this treatment in many cases but is probably not profitable in grade cows.

Abortion:

Abortion is a common cause of economic loss to the dairyman and constitutes a problem for the practicing veterinarian. Of the causes of abortion Bang's disease is by far the most common, although other causes must be recognized. The institution of the "test and slaughter" program with federal and state indemnity for reactors has served to draw particular attention to this disease, and has been practiced for a sufficient length of time to observe the results that follow. In many herds little difficulty is experienced in eliminating the infection, while in others this procedure is economic suicide to the owner. In sections where Bang infection is prevalent it is often a problem to prevent re-infection. Some herds will remain clean for years, while others will become reinfected, at times by explainable means, and at other times by means that defy detection. Attempting to eradicate the disease at the height of an "abortion storm" (herds recently infected) often entails an economic loss, even with indemnity, that the owner can not stand. In such herds the use of calfhood vaccination offers a less expensive approach with ultimate eradication relegated to some time in the future when some degree of tolerance to the infection is developed in the herd. Every herd has its individual problems to meet regarding this disease, and no set of uniform rules will fit all instances. Calfhood vaccination has a definite part to play in the program.

Of the causes other than Bang's disease, trichamoniasis is of importance although it is not nearly as prevalent as Bang's abortion. It is most frequently found in purebred herds although grades are not immune. The disease is caused by a protozoan, and spread by the bull during the act of copulation

(harbors the infection in sheath). Symptoms highly suggestive of this condition are irregular estral periods following service (40, 50 or more days), expulsion of small fetuses that are easily overlooked and pyometria. History of herd indicates that trouble started after introduction of a new herd sire. The diagnosis is clinched by finding the protozoan by microscopic examination of the fetus or pus contained in the uterus. Uterine pus is by far the best material to find the trichomonads, which are readily recognized in fresh material under the microscope with reduced light. They travel across the microscopic field by a jerky motion pushing the pus cells around as they swim through the fluid.

Females seem to develop some immunity after a time. Treatment consists in antiseptic douching cervix and uterus (2% iodine) dislodgment of corpus luteum in pyometria cases to evacuate the pus. Service should be withheld for several heat periods when most cows conceive. The treatment of bulls has not proved successful in my hands; massaging into the sheath and injection into the urethra of 5% acriflavine ointment under epidural anesthesia (large doses 1% tutocaine, 7 c. c. per 100 lbs. body weight) has been reported as giving good results. I cannot vouch for its value from personal experience. Infected bulls should not be allowed to serve non-infected cows, but cows once infected will often carry to term when served by known infected bulls. Retirement from service is often the best course.

I realize what I have presented is sketchy to a fault; I know I shall learn many things during my brief association with members of your association and only hope I have left some things of value to you. If I have, I shall feel gratified.

- - - - - - -

HOW CAN THE VETERINARIAN BEST CO-OPERATE WITH THE STATE BOARD OF HEALTH

J. W. Jackson, M. D.
Indianapolis

Dr. Rice was to have been your speaker. He was very sorry he could not meet with you this year. Although surprised to be honored with this important assignment, I feel it is a great distinction to have the privilege of meeting with you to gain rather than to impart information. I am the bearer of a message of good will not only from Dr. Rice but also from the entire personnel of the State Board of Health, including especially the Director, Dr. Harvey.

We are aware that the highly scientific techniques of your preparation are carried over into your daily work. We know that your efforts relieve suffering among a group of God's creatures that can not describe their symptoms, give an account of past illness, or discuss environmental and other potential predisposing causes of their present illness. We have some concept of the widely varying response of different animal species not only to infection, but also to remedial agents. Although these and other difficulties vastly increase the complexity of your labor, your practices increase to a corresponding degree the esteem in which you are held.

In the past the ignorant and the bigoted have at first often rejected new medical discoveries, sometimes with violence. Veterinarians have had their share of such unfortunate experiences. Edith M. Stern, in Scientific American (July, 1938) says that some years ago an inspector ordered the farmers of a Georgia community, to dip their cattle for ticks. Suspiciously the Georgians watched him mix the dipping solution. Still more suspiciously they watched him while he drove the animals through the vats. After the last cow had been dipped, so the story goes, one of the farmers wheeled about and shot the inspector. Whether or not the sequel of this story be fictitious, it seems certain that dipping vats have been blown up with dynamite and guns have been used to force inspectors off the premises. However, such incidents have never deterred the veterinarian in his campaign to make the animal kingdom safe for our democracy.

An editorial in the American Journal of Public Health (February, 1938) asserts that for years that Journal has advocated a closer relationship between the veterinary and medical professions, and has done as much as possible to bring more veterinarians into the American Public Health Association. The author expresses the hope that relations will become closer and closer every year brings further proof of the kinship between animal and human disease.

We shall indeed be proud to march side by side with you in our common fight against disease. For, after all, "There is but one medicine. If there are differences they exist in the species attacked."

Diseases which may be transmitted from animal to man are especially the concern of: the veterinarian, the physician, the parasitologist, and the health officer. Knowledge of the life history of the parasite responsible for the disease and especially of the manner by which it is spread from animal to man furnish the data for effectual control through the co-operation of those concerned.

The list of diseases that may be thus transmitted includes: Tuberculosis, anthrax, foot-and-mouth disease, brucellosis, milk sickness, actinomycosis, smallpox, cowpox, glanders, rabies, psittacosis, food poisoning, swine erysipelas, plague, tularemia, spirochetal jaundice, rat-bite fever, Rocky Mountain spotted fever, equine encephalitis, and a few others. Of these only a few of the more common diseases will be briefly outlined, from the point of view of allied attack. As already stated the discussion is not to be considered as informative, but only as a brief word picture of situations in which co-operation should be mutually beneficial.

Tuberculosis

As to tuberculosis some of the more common animals that are susceptible and with which man may be associated are: dogs, rabbits, hogs, horses, cows, goats, sheep, cats, rats, mice, parrots, and domestic fowls. Cattle may develop local infections due to the human or avian bacillus, but are readily infected with the bovine type which invades the lungs and the serous membranes of the thorax and abdomen. Infection is said to be transmitted from cow to cow by: inhalation, ingestion, sexual contact, and through an injured placenta.

Bovine tuberculosis is transmitted to man by the ingestion of milk from a diseased udder or be introduced with the manure of an infected cow.

In 1917 when the fight against bovine tuberculosis was begun the rate of infection varied from 5 to 30%. Today in 46 of our states, it is said to be less than 0.5 of 1%. In a recent article William H. Feldman, D. V. M. (American Journal of Public Health, Vol. 29, No. 11, November, 1939) says: "Numerous studies appear to establish the susceptibility of swine to avian and human tuberculosis. As a rule human bacilli enter swine by way of the digestive tract. It has been demonstrated that garbage occasioncontain human tubercle bacilli. Avian bacilli may get into garbage through the practice of adding to it the viscera of dressed fowls. The infection of swine with the human type of tubercle bacillus is usually limited to the lymph nodes. This may be a hazard to meat inspectors and slaughter house employes. In this study 25.5% of the infected animals were parasitized with the human type. This indicates careless disposal of tuberculous sputum. However, 74.5% were infected with the avian type indicating tuberculous chickens are commonly used as food. Avian tuberculosis appears to be widespread in some parts of the United States, resulting in losses that run into millions of dollars annually. In birds the disease is said to usually localize in the spleen, the liver, or the lymph nodes of the abdominal cavity.

Since the organisms usually leave infected birds with the feces the feeding grounds of domestic fowls or of hogs may be contaminated. Although hens with advanced tuberculosis may not lay eggs, some studies indicate that at least 1% of the eggs from tuberculous flocks contain living tubercle bacilli. The danger to man of avian tuberculosis is considered to be small. There are, however, records of a score or more of deaths due to this organism. More laboratory work and more autopsies might reveal the menace to be greater than is commonly supposed. Invasion of humans by the avian bacillus usually results in renal, glandular, cutaneous, or splenic lesions. Man might be infected by the ingestion of insufficiently cooked eggs. In addition, the livers of infected birds are not always cooked sufficiently to kill all the germs.

This brief narrative of the spread of tuberculosis from man to animal or from animal to man suggest many opportunities for co-operation between veterinarians and physicians as:

1. The veterinarian diagnoses the disease in infected animals, isolates or suggests proper disposal of those that are infected, and supervises practical sanitation to prevent the spread to other animals of the same or a different species.

The local health officer can support the procedure of the veterinarian because of the known danger of transfer of the infection to man. He should be able to assist in preventing the sale of animal products when it appears likely that human health is endangered. He might, for example, prohibit the sale of milk from a diseased animal or order pasteurization if disease is suspected but not proved. Each has an excellent opportunity to administer health education. Danger due to the use of infected meat may be prevented by education in proper cooking or by rejection of heavily infected animals. Co-operation has existed between veterinarians, physicians, and health officers in the control of bovine tuberculosis. However, credit must go to the veterinarians for a major role in the successful outcome in the fight. Thanks to the veterinarian, the milk we drink today is practically free from the germs of bovine tuberculosis, and the meat we eat is of a much higher standard. Would not these same co-operative procedures be useful in any disease of animals that is transmissible to man?

In some cases the adaptations of the causative organism to insure its survival make control measures unusually complicated. For example, infection with anthrax usually occurs by ingestion. This may result from grazing in pastures infected years before by other cattle or by streams from tanneries. The germs may be carried on the feet of some birds or in the digestive tracts of

small animals. Biting flies may be a factor in the transfer of the organism. In man infection may occur through an abrasion on the skin, through inhalation of dried spores by workers in dusty trades, and by the ingestion of insufficiently cooked meat. The role of the physician is to practice preventive medicine among those of his clientele whose occupation exposes them to especial hazards as: farmers, ranchmen, liverymen, veterinarians, and especially those who work with hides, hair, wool and brushes. The veterinarian and the health officer are interested in the eradication of the disease; by vaccination of animals in infested areas; by the proper disposal of the bodies of dead animals; by the sterilization of hides; by educational measures for the laity; isolation of infected animals; post-mortem examination of dead animals by the veterinarian; forbidding the sale of milk from animals during the febrile period of the disease; control and disinfection of effluents from industries using infective raw material; bacteriological examination of shipments of raw hides, hair, or bristles not known to be anthrax free; medical supervision of certain industries; and legal legislation.

Brucellosis

The term "brucellosis" has been applied by some to the response of human tissues to the pathogen that causes contagious abortion in cattle. The veterinarian is expected to diagnose the disease in animals, establish effectual hygienic procedures in animal hygiene, supervise the eradication of infected animals and help establish prophylactic procedures for those giving aid to parturient animals and for workers in slaughter houses. The physician is concerned with the diagnosis, treatment, and prevention among humans. The health officer with such public health procedures as: prohibition of the sale of raw milk from infected animals; pasteurization of milk until no suspected animal remains, but only those proved to be free from infection; and educational measures for farmers, butchers, and others especially exposed.

Food Poisoning

The ancient Israelites knew that animals that died of some diseases were unfit for food. Moses commanded, "Ye shall not eat anything that dieth of itself." However, he permitted that, "Thou mayest give it unto the sojourner within thy gates that he may eat of it; or thou mayest sell it unto a foreigner." There appear to be some who think his advice should still be followed.

Preventive measures in which co-operation between veterinarians and health officers is fundamental include:

1. Inspection to eliminate diseased animals from slaughter houses.

2. Education to reduce unnecessary handling of food; to discourage the use of food that has been kept too long; and to encourage thorough cooking as a safeguard against the toxins of all the usual contaminating organisms with the exception of enteritis.

3. Procedures to prevent contamination by rodents.

4. Laboratory studies of suspected foods.

5. Laboratory studies of vomitus and feces of patients.

6. Bacteriological studies of the excreta or from skin lesions of food handlers.

Rabies

It was once legal for the veterinarian to diagnose rabies and the farmer be paid for cattle on his diagnosis. The 1935 law provides that: "It shall be the duty of the laboratory of hygiene of the State Board of Health to make a scientific examination of the head of any animal which is suspected of being rabid, and which is submitted for examination, and the laboratory of hygiene shall serve in an advisory capacity to the several physicians of the state relative to the need of the Pasteur treatment for any person who has been bitten by any animal suspected of having rabies." Dr. Rice says this law should be changed. He emphasizes the point that it was not introduced or sponsored by representatives of the State Board of Health. In fact, the Director, Dr. Harvey, and the various executives of the personnel of the State Board of Health, especially Dr. Culbertson, Director of Laboratories, were so thoroughly convinced that the diagnosis of rabies should be left to the veterinarians that in co-operation with Dr. J. L. Axby, State Veterinarian, they made a strong effort during the last legislature to get the undesirable section of the 1935 law repealed. However, the effort failed.

Other measures in the control of rabies in which the veterinarian and the health officer can co-operate may include: laboratory examination of the brain of the animal that caused the injury; diagnostic inoculations with material from the brain of the suspected animal; disinfection of the saliva of the patient and of articles soiled therewith; immunization of the patient; detention and examination of suspected animals; quarantine of all dogs in areas where rabid animals have run at large; provision for the control of the dog population by annual license and by destruction of unlicensed animals; education in the care of dogs that includes emphasis on the serious implications of keeping dogs in densely populated areas.

Certain lower animals are frequently healthy carriers of an organism belonging to the Pasteurella group. Human beings bitten

by such animals may develop an unusual infection which may completely fail to respond to the usual treatment of such wounds. Dr. Rice relates an instance of this character which occurred several years ago when Clyde Beatty was bitten by a lion. Failure of the usual treatment led to a search for the infective organism. Scrapings from the teeth and gums of the lion were secured and a peculiar organism was isolated. The same bacillus was found in the tissues about the lacerations. Further study revealed it to be a strict aerobe. By excluding atmospheric oxygen healing progressed with almost miraculous speed. The laboratory of the State Board of Health is willing to co-operate in studies of unusual and apparently unknown types of infections from various sources as well as in the usual established procedure. In addition the Director, Dr. V. K. Harvey, will be glad to assign the proper representative to co-operate with veterinarians in any measure affecting the health of a community where such a procedure is obviously ethical and advantageous.

- - - - - - - - -

POST-VACCINATION TROUBLES IN SWINE

Dr. P. V. Neuzil
Blairstown, Iowa

- - - -

History

Post-vaccination troubles in droves of swine always have been the curse of the veterinary practitioner who has attempted to control hog cholera with serum and virus. In 1908, when Drs. Dorset, McBryde and Niles made their great discovery of the serum-virus preventive treatment for hog cholera, they patented their process in the name of the people of the United States. Their methods could then be adopted by any person to produce anti-hog cholera serum and there was no regulation of the industry whatsoever. It was some years before anti-hog cholera serum was produced for commercial use. However, some veterinary practitioners in every state successfully pioneered the use of the serum-virus treatment with serum produced commercially.

During 1913, an Act of Congress promoted the experimental use of anti-hog cholera serum produced in state laboratories. This was used in selected counties of the Corn Belt. The serum-virus simultaneous treatment was used here by United States Bureau of Animal Industry veterinary inspectors during 1914. Following this brief introductory Federal program, commercial production and veterinary use by practicing veterinarians developed at a rapid rate in most hog-raising, plague-ridden states.

Because unscrupulous persons bottled horse and beef blood to sell as anti-hog cholera serum at $15 per pint, Congress passed the most stringent laws ever to govern the operation of private enterprise. When anti-hog cholera serum is produced under license of the United States Bureau of Animal Industry, the product is kept under Government lock and key until it has passed rigid tests for potency and purity by the Government inspectors. There is no legal recourse for the hog owner in cases of post-vaccinal losses excepting to prove that the practitioner was negligent or guilty of malpractice. To prove in court that Government-tested serum was not right, it would be needful to prove that the Government inspectors were negligent of their duty.

History shows that all early-day serum was whole blood. Some of this serum was no doubt very faulty. Disastrous results followed the use of some of these products -- sometimes because the serum was not potent and sometimes from impurities and contaminations. There were early-day post-vaccinal losses caused by the spread of foot and mouth disease by infected hog cholera virus. Then the later disastrous post-vaccinal losses occasioned by the use of "pickled virus" brought about by too heavy a preservative in the virus to insure against the dissemination thereby of foot and mouth disease infection. Faulty technic and lack of sanitary measures in production and use caused many disastrous afterclaps, such as abscesses and wholesale deaths from pyemia, malignant oedema, tetanus, and other infections. Fortunately for me, these mistakes were made before my time as a veterinary practitioner.

The fear to use sufficient hog cholera virus, the use of virus without virulence, and reckoning on protection of too long a time, from the serum-alone method caused great numbers of devastating hog cholera losses in the early days, as is occasionally the case in these advanced and enlightened times. Such bad results have left bitter memories for many hog owners and veterinarians. Perhaps some of the diseases we have nowwere present in those earlier days, but it was not until 1917 and 1918 that heavy and widespread traffic in breeding animals began. Through hog cholera immunization the sale and shipment of high-priced breeding animals for long distances was made practicable and popular. Thus was Necrotic Enteritis rapidly scattered from farm to farm all over the Corn Belt during those years. Swine Flu, with its many secondary pulmonary manifestations, also made its appearance in epizootic form in the Corn Belt in 1918. Mange has spread throughout Iowa during my years as a veterinary practitioner. Hemorrhagic Enteritis has come to cause great damage. Swine Erysipelas is fast becoming a disease of major importance to Iowa hog raisers.

While parasites were present years ago, these did not seem to cause the trouble they are now making in our section of the country. Feeding conditions were not studied then and the protein supplements we now have were unknown or little used. Mineral deficiencies were unknown or unrecognized.

Now, we have very discouraging and complicated problems in the proper immunization of swine against cholera, the greatest menace to the swine industry, bar none. I am told that, in the earlier days, when trouble visited a vaccinated drove, the hog owner would believe it "hog cholera and nothing else"; also that the owner of sick unvaccinated swine would believe that "anything else but hog cholera" ailed his sick hogs. This perversity is extant to this very day.

I believe that the practitioner who states that he immunizes a great number of swine each year, and never has had any post-vaccination trouble is either not vaccinating very many pigs or else he is having post-vaccination troubles. This evil is bound to turn up at some time even under the most careful administration as all practicing veterinarians dealing with swine are fully aware. Hog cholera control by vaccination is not a bed of roses for the veterinary practitioner. Even when successfully past the three-weeks post-vaccination reaction danger period, the veterinarian sometimes feels he must sit on a sort of teakettle until the hogs are marketed and gone from the country.

In times when no hog cholera infection is imminent, very many droves are presented for vaccination where it is risky to vaccinate and risky not to vaccinate. The practitioner who gives up and will not take chances in the control of hog cholera must soon move out. Of course, it is discouraging, but, if all droves were healthy and of the right size and age, and hog cholera easy to differentiate and recognize, it would be such a simple and safe proposition -- owners could dispense with veterinary service. It is encouraging and helpful in the extreme that the serum industry has developed a more proficient technic in the production of better serum and virus. The whole-blood and clear-filled serums have given way to the sterile, improved and highly-potent concentrated serum, with vaccination shock almost a thing of the past by controlled heating of the product. Hog cholera virus has been improved by perfection and isolation of strains of high antigenic properties and purity. And we know that to be successful practitioners in the control of hog cholera, we must make a real study of every detail pertaining to swine husbandry and strive to learn all possible concerning swine diseases.

POST-VACCINATION OUTBREAKS

The subject, post-vaccination outbreaks in swine, from the veterinarian's standpoint, are conditions and diseases arising from direct or indirect action of the serum and virus upon the animal, be it in one individual or the drove as a whole. From the farmer's standpoint, this means anything which happens to the swine following the simultaneous treatment, from accident to disease, from the time of vaccination to the day they are marketed.

The term "Vaccination Breaks," "Serum Breaks," "Virus Breaks" should never be used, in my opinion. They are misleading and may be misconstrued as due to the fault either of the serum or virus. Most vaccination troubles occur when neither the serum nor virus are at fault. The term, "Loss of immunity," in my opinion, should be used but rarely. Do pigs properly treated with the simultaneous method lose their immunity? This is still a question for discussion. I do not think they do. The simultaneous treatment, when administered to healthy swine will produce an active immunity of lifelong duration, with the exception of one condition -- that is, Baby Pig Vaccination. This needs some qualification. By baby pig, I mean one that has not completed the first six weeks of life - up to six weeks of age. I do not mean that it is impossible to produce an active immunity in a pig under six weeks of age. I am certain that this can be done. I am also certain that some of these babies immunized when under six weeks of age will lose their immunity. I feel that the practice of vaccinating pigs under this age, will eventually lead a veterinary practitioner into serious trouble. My practice has been to expect a solid immunity only when the pigs are at least six weeks of age when treated with serum and virus.

To repeat the statement, thus, "The simultaneous treatment, when administered to healthy swine, of proper age, will produce an active immunity, of lifelong duration." When subsequent troubles occur and it turns out to be hog cholera, uncomplicated, I think these pigs never had an active immunity in the first place. Causes for this will be discussed later. Swine which get up from sleeping with cholera sick and dying swine and never miss a feed, are the best advertisement for cholera immunization. The reverse is very hard on the reputation of the serum-virus preventive treatment.

To determine the cause of post-vaccination troubles is often a most difficult problem. In spite of the increased knowledge of swine diseases, there is still much confusion regarding differential diagnosis. How many veterinarians can differentiate hog cholera from swine erysipelas without a laboratory diagnosis? I cannot, and I am certain very few, if any, practitioners can. Then,

too, there is always the possibility of both diseases being present at the same time in the same animal. Dr. C. N. McBryde, of the United States Bureau of Animal Industry Experiment Station at Ames, Iowa, in a report some years ago, stated that when hog cholera is present, a leukopenia is found; that is, the white cell or leukocyte count is generally reduced to 8,000 per cubic millimeter or less. However, a count in excess of 8,000 cannot be taken as a sure indication of the absence of that disease. Leukopenia also occurs during the process of immunization, following the simultaneous treatment with serum and virus. This leukopenia lasts for several days, thus reducing the body resistance to active diseases. It is one of the real reasons for post-vaccination troubles.

In the same report, Dr. McBryde states that the leukopenia is less marked when larger doses of serum are administered. Where smaller doses of serum are used, the leukopenia is more extreme and of longer duration. This should mean that the veterinarian using a larger dose of serum should have the least post-vaccination troubles. This leukopenia is one of the reasons why it is no waste of serum to administer increased doses, to even the best droves presented for vaccination. This I am quite certain is true and I will give you a good example in this paper. Post-vaccination trouble can be divided into two classes:

Short time cases, where trouble arises within the first 21 days.

Long time cases, where trouble arises after 21 days.

These will have attention under "Handling of Post-Vaccination Troubles."

EXCITING CAUSES OF POST-VACCINATION TROUBLES

These I will take up in the order of their prevalence, in my opinion. In some cases, two or more of these factors may be present at the same time.

Barnyard Diseases: Filth-borne diseases except parasites.

(a) Enteric diseases such as Necrotic Enteritis, Hemorrhagic Enteritis, Suipestifer Infection, Paratyphoid Infection, and Coccidiosis. These usually appear from the 7th to the 12th day following Vaccination.

(b) Pulmonary Diseases such as Dust Cough, Pulmonary Oedema, Pneumonia, Pulmonary Tuberculosis, Shipping Fever, and Flu. These conditions usually appear from 7 to 15 days following vaccination.

Parasites:

(a) Internal, such as Ascarids, Thornheads and lung-worms.

(b) External, such as Scabies and Lice. Animals debilitated by parasitic infestations are poor risks for hog cholera immunization. Build them up by correct treatment and vaccinate later.

Virus Diseases, such as Swine Pox.

Feeding, as

(a) Overfeeding. High Protein feeds. Following cattle in feed yards. Spoiled feeds.

(b) Forced feeding of irritants shortly after vaccination, such as nostrums and minerals.

(c) New corn or new oats or new barley immediately following vaccination.

(d) Poisoning by cockleburrs, wild chamomile and belladonna.

(e) Polluted water.

(f) Change of ration.

Serum Dosage:

(a) Small dose of serum when animal is infected with Barnyard infections and Parasites.

(b) Under-estimated size of pigs vaccinated.

(c) Leakage of serum from site of injection.

Housing and Management:

(a) Crowded sleeping quarters.

(b) Improper sleeping quarters such as sleeping with cattle. Fence off a sleeping section for the swine.

(c) Drafts.

(d) Dark and dust infected quarters.

(e) Moving to strange or infected quarters.

(f) Infected mud holes.

(g) Lack of shade in the summer time.

(h) Lying in cold spring water.

(i) Overheating.

Virus Dosage:

(a) Virus in too small a dose may not become absorbed; may become encapsulated; may be killed or neutralized by antibodies present in the animal; or may be overcome by excessive antibodies in increased dose of serum.

(b) Leakage of virus from site of injection.

(c) Absorption of virus by abscess formation.

(d) Virus of low or no virulence.

Other Diseases:

(a) Erysipelas; (b) Pox; (c) Flu; (d) Malignant Oedema.

Miscellaneous:

(a) Pregnant sows vaccinated within three weeks of farrowing have been known to infect their pigs shortly after birth. Such pigs should be given serum and virus and again vaccinated at weaning time.

(b) Abortion or the birth of sickly squealers. These are caused by rough handling of the pregnant sow while vaccinating, recent exposure to hog cholera virus, or latent infections stirred up by the virus administration.

(c) Vaccinating pigs affected with pox and permitting the

owner to dip them with stock dips of unknown strength.

(d) Stoppage of growth following vaccination for no apparent reason.

(e) Tetanus and other infections in wounds of castration too near vaccination.

(f) Infections from inserting nose rings at time of vaccination.

(g) Rumors that are false, especially following prompt and efficient diagnosis and treatment with a nominal loss.

Sales Barns: Bringing in of sales barn pigs and permitting them to be with native pigs (vaccinated) frequently brings enteric and pulmonary infections.

Farmer Vaccination: Due to overconfidence in his own ability, many farmer vaccinated herds are responsible for neighborhood outbreaks.

HANDLING POST-VACCINAL TROUBLES

To effectively handle a post-vaccination case, it is first necessary to determine, if practicable, which is the primary condition. In other words, find out the true cause. Without knowing the true cause, it is impossible to proceed wisely, and with benefit to the drove, the owner, and yourself. Perform careful and thorough autopsies, on dead and sick pigs.

One should always wear rubber gloves in making autopsies, for protection. Though cumbersome, they may save an infection. Erysipeloid infection of your skin may be remedied without lasting effects, but not so a heart lesion from this infection. Look into all angles and inspect the premises, the feed, and the water supply, and utensils. My practice is to always give the owner the benefit of the doubt. I gather specimens from a typically-infected pig to send to the diagnostic laboratory whenever septicemic infection is found, even if only to confirm my findings. Here, as in all other disease conditions, we must have a complete history of the drove. Even after autopsies are made, it is impossible to determine the true condition at times. It should always be kept in mind, in the majority of cases where trouble starts within three weeks after vaccination, that petechial hemorrhages will be found regardless of the complicating factors. I wish to state here, in these cases, re-vaccination is of little or no value.

In handling cases of post-vaccinal troubles, the veterinarian should most certainly be sympathetic, willing, and tactful. The owner surely has the right to believe that the best veterinarian in the world can sometimes be in error. We should not censure him for foolishly seeking advice elsewhere when he is

worried because his vaccinated hogs are sick and dying. We certainly can feel more sympathy for the prudent hog owner in whose vaccinated drove losses are occurring than we would for the owner of a cholera sick drove due to neglect of immunization. Why not give more serum when a grave upset has occurred in a recently-vaccinated drove of swine? You know that a sort of negative phase results where the serum alone is administered in such cases and the complicating infections, which are paramount, do damage worse than ever following the use of more serum, so you have done no good, and only harm.

Why shouldn't we give the owner and client the benefit of the doubt when sickness and loss simulating hog cholera occur in a long-time vaccinated drove? Why not re-vaccinate at once and be sure? You all know that administration of the serum-virus treatment can be calculated to do only one thing, but to do that thing well. That is to protect hogs from hog cholera. The administration of serum and virus to animals sick with some other infection will only serve to aggravate the infection which is present. We do not wish to do harm and gum up the works. We feel that the infection cannot possibly be hog cholera virus and that the re-vaccination can not benefit the drove at all. For those who have but little faith in their choice of products and their use of same, and no belief that pigs they vaccinate will stay vaccinated, they will soon have to move from that location. To re-vaccinate or give more serum, at once, in post-vaccination trouble, perhaps at the owner's insistence, is the easiest way to pacify the owner -- for the time being. When the owner is not benefited by this procedure, then the veterinarian is up against the stump for fair.

When a few pigs sicken and die shortly following vaccination the owner sometimes asks if the serum could have been all right. You point out that most of the pigs in the drove have got along fine, did not get sick, and prove to him that the serum was potent. Then the owner wants to know if it couldn't have been a bottle of bad serum. It is well to explain this thoroughly that there can be no such thing as "a bad bottle of serum," and that each bottle of a serial contains serum of exactly the same potency.

Irate owners sometimes make outrageous demands of the veterinarian for payment of the loss in dead swine following vaccination. This is unfair and unjust. The veterinarian should not be held responsible for factors which caused the loss over which he has no control. Can the veterinarian make sure of the management of the drove after vaccinating? Can he be expected to

guarantee his vaccination and pit his work against all nature, any more than he could in any other operation? Certainly, the nominal profit from vaccinating could not be considered also a premium on an insurance policy to cover the health of the drove and protect the owner against loss from all hazards. To guarantee the vaccinating job would be gambling that nothing was the matter with the drove when vaccinated and that no mismanagement would happen after vaccinating.

If the serum producer were to reimburse the hog owner thru the veterinarian, or directly, for post-vaccinal loss, a very bad precedent would be established, which would ruin the practitioner. Every hog owner in that region would expect thereafter to be paid fancy prices for every animal which dies on the farm from whatever cause.

In handling such cases, my routine practice is as follows: (1) Segregate the sick from the healthy and remove healthy pigs to clean quarters. (2) Place healthy pigs on a reduced ration, a light diet of oats, buttermilk, or alfalfa meal, and pasture, when available. (3) Supply plenty of fresh water, winter or summer.

In the majority of cases, these measures alone will correct the condition. If the pigs continue to sicken and no apparent cause has been determined, the process is repeated and the quarters changed again. It is well to keep in close contact with these droves, and see them often. When Enteritis is present:

The drove is put in clean quarters; Alkaline treatment is administered and corn removed from the ration. In mild cases, I use Sodium bicarbonate, one pound to ten gallons of drinking water, or one pint of a 3% Sodium hypochlorite solution to fifteen gallons of water in soaked oats; or oats soaked in any commercial alkalinizing powder or solution. And the owner is always charged for services and medicine used.

There are occasions when it is found essential to move the pigs to clean quarters several times. When pigs are too young to do damage, a corn field is the most free of disease germs of any place on the farm with plenty of shade provided. If new cases continue, Enteritis Bacterin is administered, which is of value at times. Give light, easily-digested feeds and be certain that the sick are segregated from the healthy.

When Pulmonary Conditions are present, they are generally more severe and more difficult to control. If few animals are affected, remove the healthy pigs to clean quarters. Give good

ventilation; in winter, free from drafts. In summer, put on clean pasture, supply ample shade, free from dust. Here, the water supply is very important. Drinking fountains should be discontinued. Water should be supplied fresh at frequent intervals, in open troughs. Sodium bicarbonate may be added to the water with the same strength as above. The use of guaiacol compound sprays, in the bedding, is recommended. Also to be given in soaked feeds or swill. Here, again, the use of bacterin is of value, at times.

Re-vaccination of the entire herd may be necessary in some droves. However, I have never had the misfortune to see such a case. I certainly would not withhold such treatment, if necessary.

In all post-vaccination cases, I think we are justified in making a thorough investigation to determine the cause. By failure to do so, we can miss such simple causes as salt, mineral, food, and ptomaine poisonings. We should give some logical treatment at the owner's expense to protect ourselves and to satisfy the owner. By neglecting these cases, we only help increase the danger of the owner looking for help from outside sources, sometimes an enemy to us.

When the owner of swine sick following vaccination adopts the attitude that you are wrong this time, which he has a license to do, he does so because you have failed to convince him that you are right. It is always well, at the very start of such trouble, to try very hard to arrive at the real and basic cause of the sickness and loss. Pathological specimens should be sent to a laboratory for examination and tests, whether or not the complicating factor is evident. If there be the least doubt, it is well to enlist the services of the field swine disease experts of the Hog Cholera Control Division of the United States Bureau of Animal Industry or those employed by the serum producer.

RECOMMENDATIONS FOR THE PREVENTION OF POST-VACCINATION TROUBLES.

1. Careful examination and study of the drove to be vaccinated: (a) For detection of disease conditions; (b) For determining size of the pigs and dose to be given; (c) For obtaining history of the drove, age, etc.
2. Knowledge of disease conditions on the farm.

This is very important as quite frequently the pigs look thrifty but with the knowledge that perhaps, enteritis, pulmonary diseases, or parasites were present the year previous, may save you much trouble. As an example, a case last year is recited:

In 1921 Mr. A called me to vaccinate his drove of

144 pigs. They were good thrifty-looking Chester White pigs about fifty pounds average. I gave an average of 32 c. c. per pig of serum and 2 c. c. of virus. We had a sad post-vaccination experience with enteritis and a loss of 34 pigs.

The next year, I vaccinated for Mr. A again, this time increasing the dose of serum to 36 c. c. on forty pound pigs with 3 c. c. of virus and had no trouble. I continued vaccinating for Mr. A. right along until last year when a colleague of mine treated the drove. He had a sorrowful experience. His loss was 54 head of good-looking shoats out of 156 head vaccinated. This veterinarian claimed to have used 32 c. c. serum doses on fifty-pound shoats and I think he did, but the loss was there just the same.

This year my old client, Mr. A., was back with me again. He came in and said, "Well, Doctor, I thought I could save $8 on my vaccinating bill last year, and I lost over $250 worth of pigs. I guess you had better come out and vaccinate my pigs tomorrow."

Nothing was said about my price but I could not resist the temptation to tell him that I had learned a lesson back in 1921 and that I could not afford to use lesser doses of serum and virus on his farm.

I do not allow the insertion of nose rings, marking by ear slitting or tail lopping, castration, nor dipping at the time of vaccination. I point out that immunization is too serious a matter for the animal economy to be required to withstand any other operation, simultaneously, and that disastrous results have happened from these practices. I feel that practitioners who permit these operations, "just to save the owner another handling of the pigs," are working against their own best interests by showing so little respect for the importance of immunization, and are surely unaware of the big risks they are taking with the property of their clients.

The owner of a cholera-sick drove should be informed that all the drove might die following vaccination since we have no curative treatment for hog cholera and because the preventive treatment being administered may be too late. It is far easier and far better to tell the owner during the administration than after severe losses have occurred.

It sometimes happens that a large number of the pigs are too sick to vaccinate in a cholera-sick drove and these sick pigs are not killed. The percentage of recovery may be much higher in the sick group than in those well enough to vaccinate, in which a large

loss occurs. This is always possible since hog cholera virus may not be the cause of the sickness in all the hogs, and most of our hog cholera cases are complications on top of some other disease or infection, it is better to treat the sick or kill them outright while on the farm.

In cholera-sick droves evidencing previous or other infection, it is well to employ the bacterin with the serum and virus. More pigs will be saved by this procedure in most instances. Many veterinarians quite successfully practice this three-way or triple preventive treatment with bacterin, serum, and virus, where the farm has a history of previous post-vaccination trouble.

CARE OF SERUM AND VIRUS

We veterinarians purchase serum and virus from reputable serum companies who take pride in producing and protecting a high-grade product. We should take the same precaution of protecting these products from freezing, high temperatures, and light rays while they are in our hands. The work of Drs. Ray and Whipple on temperatures in enclosed automobiles in summer time as given at the American Veterinary Medical Association meeting at Memphis last year, was surprising to me, and, no doubt, to many other veterinarians. Any veterinarian who has not heard or read Dr. Ray's article should do so. Time will not permit repetition here. It is definitely known that heating of virus will reduce its antigenic properties. Serum and virus should be refrigerated by the practitioner and should be protected from excessive temperatures, in the summer time. Portable ice boxes for biologicals are on the market and every veterinarian should use one winter and summer. I make it a practice to know the number of pigs I intend to vaccinate before I leave for the country and carry a very little more virus than is necessary to complete the job. I consider it wiser to send some one into town for more virus than to take the chance of having some virus spoil and not to know it.

DOSAGE

The dosage of serum given to us by the United States Bureau of Animal Industry on the labels of the serum bottles is the minimum dose. It is known that serum must pass a test in doses of 15 c. c. for pigs weighing from 40 to 90 lbs., but the same serum is labeled with a minimum dose of 28 c. c. for the same size of pig. Personally, I think the minimum doses on the bottle labels are much too small for our average pigs in the field. No pig should receive less than 30 c. c. of serum. The 40 to 60 lb. pig minimum dose should be 32 c. c., and pigs from 60 to 90 lbs. should receive

as a minimum dose, 36 c. c. and dosages should be graduated upwards from even these minimum doses, and greatly increased in cases of known exposure, etc. Greatly increased doses of serum should be given to all the individual members of an exposed or sick drove no matter what their apparent condition. It is a poor place to save serum. Our country still smarts from the devastating losses in a large drove of pure-bred cholera-sick Hampshire swine. Several hundred head died because the hard-headed and aged veterinarian, now some years deceased, failed to increase his doses of serum when treating the sick drove.

The dosage of virus is very important. I never use less than 3 c. c. of virus per pig, nowadays. If a dose of serum be used sufficient to protect the pig from cholera, the same size dose of virus can be given without harm. We must give enough virus to be sure to stimulate active immunity. Why not always give a greater dose to insure that natural antibodies did not destroy the virus in the pocket before antigenic effect takes place.

AFTER CARE OF THE VACCINATED DROVE

My instruction to the owner is as follows:

1. Reduce the feed on these pigs one-half for the next five days, then gradually increase this feed until they are back on full feed at the end of ten days.
2. Do not change their present quarters, if satisfactory.
3. Be careful of exposure to infection in the next two weeks. Do notadd any animals to the drove.
4. Watch out for infected dust and infected mud holes.

RESPONSIBILITY OF THE VETERINARIAN

What is our responsibility to the owner? Our clients place confidence in our ability and varacity by allowing us to treat their swine. With the countless numbers of post-vaccination troubles in the past, don't you think they would be a little skeptical about subjecting their droves to such a dangerous procedure? This angle is one we sometimes overlook. We have a responsibility under the law to use the best methods and products available. We should always instruct the owner to report on the progress of his drove. Give him every consideration possible, working for his interests at all times. In this connection, it is my observation that pigs always do better after vaccination if the vaccination bill has been paid. It is far easier to convince an owner of pigs suffering with post-vaccination trouble as to the real cause of the upset when the vaccination job has

been paid for. It is human nature to respect the value of the products and service for which one has paid.

RESPONSIBILITY OF OWNER TO VETERINARIAN

The owner should follow the veterinarian's instructions very carefully. Here is where the veterinarian can get into trouble. The hogs the owner submits for treatment are under the veterinarian's care. The owner should be properly instructed to this fact and come to the veterinarian for advice when in trouble, not to some mineral peddler or other veterinarian. In case of trouble, the owner, in most cases, thinks it is hog cholera and wants some outside advice, sometimes on the principle that the best man in the world cannot always be right. Here our responsibility to him and his responsibility to us is mutual, which also interlocks the responsibility to other veterinarians and the veterinary profession. It is a human impossibility to make all veterinarians honest and to make all farmers truthful. To illustrate this:

One afternoon, a few years back, a farmer called me to see some sick pigs. I should have been somewhat suspicious had he not been a client of mine. However, I proceeded to make an examination of the drove. I obtained the history that he had lost 12 head of pigs in four days and that they had been sick for about six or seven days. The temperatures ran from 103 to 107° F. in the sick pigs. There were 87 pigs in the drove and about 15 pigs sick. I suspected hog cholera but did not mention the fact. On autopsy, lesions consisted of hemorrhages on epiglottis, lungs, spleen, gall bladder, kidneys, and urinary bladder and congested lymph glands. A slight enteritis was present in the first pig autopsied. For some unknown reason, I asked if the pigs were previously treated with serum and virus -- not ever having vaccinated any pigs for him, with no hog cholera in the neighborhood to my knowledge. He replied, "No, they have never been vaccinated."

The autopsy on the second pig showed very few lesions, slight enteritis, but nothing else. A third pig was autopsied and during the autopsy, I asked again whether or not the pigs were vaccinated. He stated no. This pig showed much the same lesions as the first pig, with the addition of heavy infestation with ascaris. I made the statement that I thought the condition was hog cholera but the drove was in poor condition for vaccination, and I thought the results would be very unsatisfactory. But the only thing to do was to vaccinate. We stood on the feeding platform looking over the drove when he said, "Suppose I told you these pigs were vaccinated for hog cholera."

This was a surprise to me, but I told him that such could be

possible and asked him who had done the work. He told me Dr. C, one of my colleagues. Right here we went into conference. I explained to the owner I couldn't help him if he were going to be untruthful to me. That he could not expect help if he didn't give us all the facts. Told him the lesions of hog cholera presented were the result of the treatment. He wanted me to revaccinate for him but I refused. I told him to call Dr. C. who vaccinated his pigs, and we would get together, and that I would wait. Dr. C. was out and could not be found so we made arrangements to meet at the farm the next morning at eight o'clock. When I arrived, Dr. C. was already present, and the owner had told him that I had diagnosed the case as hog cholera. Dr. C. was in a very poor humor to talk when he saw me. However, being friends, we did not fight. I just said, "Now, Leo, tell Dr. C. what has happened. If you do not tell him the truth, I will correct you."

The story was the truth and Dr. C. was much relieved. I suggested more autopsies. Two pigs had died during the night. No more came down, but the sick pigs were showing a marked diarrhea, something I had not seen the day before. Autopsies on these pigs showed an acute enteritis and some petechial hemorrhages. Dr. C. and I gave this owner a real going over. The sick pigs were separated and the healthy pigs were given a dose of enteritis bacterin and placed out on clean stubble, supplying shade by building a straw shed. These pigs were treated with an alkaline solution and soaked oats. No more pigs became sick. Those sick all died and a very compromising situation was averted. This case report takes in the responsibility of the owner to the veterinarian, also the responsibility of one veterinarian for the other. I have had similar cases in my practice. The outcome of all were very satisfactory. The faith of the owner in the serum-simultaneous preventive treatment for cholera was always maintained.

RECORDS

Records of hog cholera vaccination are very important. I am told by several Federal inspectors that many veterinarians do not keep records of droves vaccinated. A complete record should be kept on all droves vaccinated. Records should consist of:

Name of owner, date, number of pigs treated, size of pigs, breed, serial number of serum and amount used, serial number of virus and amount used, number of pigs sick or unthrifty, number of pigs died before treatment, condition of pigs at time of vaccination, mange, lice, etc., recommendation made for improvement, if any, and amount of bill.

These record books should have ample space for notations for use at a later time. The reason is, if post-vaccination

troubles occur, make record of findings and treatment; also final results. When vaccination certificates are requested, the record should show for removal to sale barn, interstate shipment or private sale and the number of pigs on each certificate. During the first year of the Corn-Hog Program, my records were very useful to the owners in making our their hog allotments.

This is rather a rambling paper. If you do not agree with me, I am sorry. If I can answer any of your questions, I will be pleased. Gentlemen, I thank you. (Applause)

- - - - - - - -

EQUINE PRACTICE

Dr. G. G. Franks
Grimes, Iowa

Every veterinarian has his good days and his bad ones. In the first he is apt to think pretty well of himself, but in the second he wonders just why he is attempting to practice veterinary medicine. In the latter, however, if a cool head and a steady nerve be maintained, one can usually make a creditable showing, but to be called upon to address a group of men just as conversant with a subject, if not more so than yourself, then you are on a spot, and it is with anxiety I present this paper, but hope it will be received in the spirit in which it is given, not for its literary or scientific merits, but simply as a review, that may stimulate some thought or bring back one forgotten.

On arriving at the quarters of our patient, the first procedure is that of examination. Generally speaking it is my custom to do this leisurely and systematically, first because one is less liable to overlook important points, for after all what is treatment without diagnosis, and, of course, this should be correct. Secondly, by casual conversational questioning of the owner or attendant during this time, one can get more reliable information as to history, cause, etc., than by direct quizzing. The animal should first be observed as it stands, as they sometimes assume positions that are characteristic of certain diseases. If necessary the patient may be led out for further scrutiny. After an examination of this kind your efforts may be directed, as the symptoms indicate, toward the assistance of nature in effecting a recovery. I think, however, there are exceptions to this kind of an examination; for instance, you may walk into a stable, the horse exhibits great distress, nostrils dilated, breathing rapid, and eructation of gas from the stomach, you reach for your stomach tube as automatically as you put your foot on the brake at a stop sign.

Treatment of disease may be medicinal or mechanical (as in the use of a stomach pump), hygienic, surgical, etc. The method used in the administration of drugs is very important also. The ability to foresee an unsatisfactory outcome and advise accordingly, as well as the correct diagnosis and treatment, resulting in recovery is quite essential. I believe it is generally conceded, more horses die from digestive disturbances than all other diseases combined, so these must be of major importance. The most common causes are eating too fast, especially after working hard; watering too soon after a meal; faulty teeth; sudden change of diet; damaged feed; fibrous feed and parasites. The latter have been definitely proved guilty following campaigns for the eradication of parasites, in which, not one but several horses known as "chronic belly-achers" ceased to cause their owners further trouble.

The stomach tube to me is not only an instrument for lavage and the introduction of medicines, but is of great assistance in making a diagnosis. It should be passed in all cases of gastric indigestion, and if you are not sure of the exact location of the trouble pass it anyway. Just as the stomach tube is a sure and quick method for the alleviation of gastric flatulance so is the trocar in relieving distended bowels. In cases in which the latter is indicated, don't put off its use too long, as a lot of needless suffering can be eliminated, and recovery speeded up materially. If a sterile trocar is used under aseptic conditions one need have but little fear of an unfavorable aftermath.

My favorite drug in the control of excessive pain, due to digestive disturbances, is chloral hydrate, as it has no constipating after-effect. In indigestion we like mineral oil in which is incorporated antiferments, carminatives or stimulants, depending on the stage and course of the attack. It makes a good lubricant and helps prevent absorption of toxins.

For impactions, we are partial to the salines, pumped through the tube in large quantities of warm water. The latter tends to soften and break down the impacted mass. This can be repeated as deemed advisable. Pump in slowly for the more liquid one is able to administer the better. To these solutions your corrective and supporting drugs may be added. Enemas in copious quantities are of some value and are surely indicated.

I find in my practice a rather common condition which I term bilious attacks. These are characterized by icterus, sluggish bowels and loss of appetite, but the pulse generally remains good. The animal exhibits little or no abdominal pain, but just stands or lies around, and if I can read equine actions, is possessed of

quite a headache. These cases usually respond nicely to an aloetic bolus and stimulants. If, however, they are neglected, bad impactions are apt to develop. I deem it the veterinarian's duty to inquire into and try to determine the causes of digestive disorders, and attempt to remedy them. Dry bran as a part of the ration usually is beneficial. The driving of staples at intervals over the floor of the feed box to insure slow feeding is of considerable value. Also examination of the teeth and correction of any abnormalities found.

The quick-acting cathartics have their place. My favorite is arecoline given in small broken doses, one-fourth of a grain. In the treatment of the aforementioned conditions, let the pulse be your guide, as the amount, kind and frequencyof stimulant to be administered may be the difference between recovery or death. Psychology can also play an important part. No doubt every one of you have worked for hours with a bad case of indigestion. Finally the pain ceases, peristalsis is resumed, the pulse improves, and your patient seems well on the road to recovery; then for no apparent reason it just quits. If it is a mule you probably can not even get him up, or maybe it is a horse that just stands braced, ears dropped and an expression on his face of "Oh, what's the use". A little carbon disulphide distributed along his spine, or a few prods from an electric cane will do for him what the now classic remark uttered by Bill Terry, manager of the New York Giants, "Is Brooklyn still in the National League?" did for the Dodgers: make him mad, and put the old fight into him; he forgets his troubles, wants to live, and does.

As some derangement of the digestive tract is usually the cause of laminitis, a discussion at this time seems quite appropriate. Until the last few years, phlebotomy had been my chief and first procedure, drawing from one and one-half to two and one-half gallons of blood, depending on the size of the animal. Of late, however, we have been using normal horse serum injected intramuscularly in its stead, and find it works quite on a par with bleeding. In either case mineral oil is usually given, but in some instances where the droppings are normal aloes is used. Never give aloes to a stallion as superpurgation is apt to follow. Next wet packs areapplied to the feet and kept wet by frequent soaking. I like to keep the patient quiet, and induce him to lie down, if possible. Comfortable quarters with plenty of good bedding will often bring this about. Casting is resorted to if everything else fails.

When called to see a case of choke the stomach tube is almost invariably passed. If the obstruction is small its removal is easily accomplished; if not, you are all set to continue until

the condition is relieved. The point I am trying to bring out is, rarely do I depend on medication, as one frequently has to return, thus causing the owner added expense, and this may leave such a bad taste in his mouth, you lose a client. If the animal is hospitalized, a pail of water is placed where the patient can play in it, and arecoline given hypodermically. This gives satisfactory results in a great many cases. Some practitioners, after passing the tube, draw the head downward by snubbing to the floor. The animal usually resents this and in his struggles bad results are apt to follow. I prefer to leave the head in its natural position. Now, the pump is attached to the tube, and a few strokes given to force water down onto the choke; it is then detached and the tube moved back and forth in quick short strokes which causes more or less of the choke to flow out thru the tube. This is repeated until the obstruction is removed or forced down. Now, tie up the animal so no feed can be reached and place a pail of water within easy access. No food should be given for at least twelve hours.

Azoturia or hemoglobinuria being at least dietary must be mentioned before leaving this group of diseases. To me this is one of the most discouraging diseases we have to treat. I never know what the patient is going to do, make a sudden recovery, pass out or neither. The regular treatments work with little similarity or dependability. The use of calcium gluconate in this disease is a darn good trick if it works; if it does not, one can still go ahead with his routine treatment. Until something better is found this is my first step. We will cite you the first case on which I used this treatment. This was a chestnut gelding of the handy type, weight around thirteen hundred pounds. He was down on the ground in the barn yard and literally pounding himself to pieces. While looking him over, I learned he had stood in the barn two days; this particular morning the hired man had taken him and his mate on an errand to a neighbor's about one and one-half miles distant. On arriving there it was noticed this horse did not act right, and being a young fellow and having had no experience with azoturia, it was the old story of try and get him home. This he just barely accomplished as the horse went down just inside the gate. In due time three or four neighbors appeared on the scene and with their help it was possible to keep the animal more or less in position. Three hundred c. c. of calcium gluconate was slowly injected intravenously, and to everyone's surprise, the miracle happened in about fifteen minutes. He arose to his feet without any assistance whatever, was let stand about five minutes, when he was led into the barn, where he began eating hay. No other treatment was given and an uneventful recovery was made.

In the treatment of tetanus give me a comfortable, darkened stall away from noise and disturbance, place a bucket of water with about two ounces of hyposulphite of soda for each gallon, where it can readily be reached by the patient. Let one person do a good job of nursing and a lot of dosing will be superfluous.

Prophylactic treatment of the dam by giving three doses of bacterin a week apart a month or six weeks before foaling time has become routine with me in the treatment of navel ill. A few years ago I had the opportunity of trying this out in quite a large band of Belgian mares, on a farm where the mortality in the foals due to navel ill was so great it was about to put the owner out of business. I don't mean the disease was eliminated in the foals but when the disease did appear, the virility of the attack seemed to be lowered to such an extent that most of them readily responded to treatment, which in most cases consisted of bacterins or citrated blood from the dam, or both. The last year or two a number of practitioners have reported good results from the use of sulfanilamide.

Poll evil and fistula are still quite prevalent, especially the latter. In the treatment of these conditions I have discarded all surgery except for liberating pus. Otherwise the arsenic and willow bark treatment is depended on entirely and with excellent results. The patient may be worked during treatment, and the chance of developing a vicious temperament due to the pain caused by the initial operation and subsequent dressings is eliminated.

No doubt most of you have treated horses with occluded lachrymal ducts, by inserting a small tube in the nasal opening and forcing water into the duct until the obstruction is cleared away and the water flows freely out around the eye. Just a tip if you are called upon to treat this condition in a mule: don't look for the opening of the duct on the floor of the nasal chamber as in the horse, for it will be found in the roof.

I want to put in a plug for chloral hydrate as a one-man anesthetic for the large animals. As an example: This last fall I was called to see an eighteen hundred pound Percheron mare, which the owner told me over the telephone had a shoulder abscess. On examination I found this to be of the cold or levator humeri type. As you all know, the great tumefaction of these conditions and the sometimes very small pus pockets, buried deep in the mass, and to make matters worse the left shoulder was the one involved. Not so good for a right-handed operator to attempt on the run. With no stocks in which to restrain the animal, I was face to face with

quite a problem. I finally gave this mare two ounces of chloral hydrate dissolved in two gallons of warm water via the stomach tube. While waiting for this to take effect, I ran a ring of local anesthesia punctures under the skin around the swelling. About this time difficulty in locomotion was shown by the mare, whereupon the operation was performed without the least bit of trouble. If complete prolonged anesthesia is desired, the job can be completed with chloroform.

While our horse population has greatly decreased in numbers, we still have quite a bit of influenza, due to the fact, a great many of our replacements come from sale barns. These animals, usually infected, carry the disease to the horses already on the farm. In treatment the knife is used to drain abscesses or to open the way for the trachea tube in cases of severe dyspnea. Bacterins and anti-influenza serum are indicated at the onset. Neoarsphenamine and sodium cacodylate are also popular with a great many veterinarians. Medicinal treatment varies with the symptoms presented, but is of a supportive nature in the main. As a routine treatment I always give four ounces of sodium sulphate in a bucket of water once a day for four days. To me this is very important.

Probably no disease with which we come in contact requires such good judgment in handling as pneumonia. It cannot be aborted; therefore, heroic treatment is to be avoided as any attempt to interfere with the regular course is apt to end in disaster. One should give assistance to the defensive and constructive forces of the patient's system with stimulating and tonic medicine, hygiene, suitable diet and nursing. Give serums and bacterins to prevent or lessen complications and alteratives to shorten the period of convalescence. Avoid anything and everything, the effect of which is depressing. Endeavor to keep the patient cheerful by good nursing, sanitation, hygiene and enticing food. Always remove any food not promptly eaten. If proper ventilation of the quarters cannot be arranged, put on proper clothing and move the horse outdoors. Fresh air is half the battle. Observe your patient with especial care from the fifth to the eighth day. I always begin treatment with an application of white liniment over the lungs, under a good wool blanket. If it does nothing else it has a very beneficial psychological effect and for this reason we like it much better than stickey mixtures as it can be repeated.

Two case reports on the use of sulfanilamide: First, a gray Percheron mare was noticed trying to foal one morning; the owner called me eighteen hours later. After much difficulty the foal was delivered. No attempt was made at that time to remove the placenta. Went back the next morning about eight o'clock. Mare

in great distress, temperature 104.4, pulse rapid, nostrils dilated, and breathing labored. Removed the membranes and gave the mare three hundred grains of sulfanilamide. In twenty-four hours she was very much improved. We gave her two hundred and forty grains of sulfanilamide at this time and she made a nice recovery. Second, black Percheron mare cut under fore fetlock by plow. When I first saw her she was very lame, and between the fetlock and knee along the flexor tendons were abscesses, six in number. Drained those not already open; put on antiseptic pack. Gave the animal 840 grains of sulfanilamide over a period of four days. In forty-eight hours there was a very noticeable change for the better and, while that leg is thickened, the animal works every day.

No paper on equine practice at this time would be complete without saying something about encephalomyelitis. In 1937 the disease first made its appearance in central Iowa about the middle of August. It was ushered in with vigor. After about a week, however, the virulence seemed to abate and the mortality was low from then on out. In 1938 my first case was on the first day of July. The disease was hottest the last week of July and the first week of August, then, as in 1937 the virulence dropped and likewise the death rate. Had several breaks in horses I had treated with brain tissue vaccine. In 1939 very few cases were noted and most of these appeared late in the season. The boys had an average of three or four cases. In that year about 50% of the horses in Iowa were treated with chick vaccine, and breaks were very rare. The decided drop in the incidence of infection for this year was no doubt due to the barrier built up by vaccination and natural immunity. The veterinarians were divided on the use of slings and racks for supporting sick animals. I prefer a spacious stall with plenty of bedding (belly deep). A corn crib driveway makes a good place and there is generally a good breeze. I use serums, normal saline solution, calcium gluconate, and 50% glucose. The latter seemed to give the quickest pick-up of the four. Last year I had so few cases, did not try the late encephalomyelitis serum, but understand it was much more potent than that of previous years. One gallon of mineral oil was usually administered through the stomach tube after which water was pumped in. Unless the patient drinks freely the stomach tube was passed every twenty-four hours and water pumped in to take care of the dehydration. Succulent feeds were given. Oats should not be a part of the ration as chokes are apt to result. Instruct the attendant to water patient hourly. In the bad cases I was most successful in those that received the best nursing.

The treatment of disease might be compared to a football in great distress, temperature 103.9, pulse rapid, nostrils dilated, and breathing labored. Treated the condition and gave the mare three hundred grains of sulfadiazine. In twenty-four hours she was very much improved. We gave her two hundred and forty grains of sulfadiazine at this time and she made a nice recovery. Second, Black Percheron mare cut badly [illegible] of plow. When I first saw her she was very lame and between the fetlock and knee along the flexor tendons were abscesses; she is nervous. [illegible] pack. Gave the animal 840 grains of sulfadiazine over a period of four days. In forty-eight hours there was a very noticeable change for the better and, while the mare was lame, the animal works every day.

Perhaps an [illegible] of this they would be practical [illegible], something about encephalomyelitis. In 1937 the disease first made its appearance in [illegible] about the middle of August. It was [illegible]. After about a week, however, the [illegible] seemed to [illegible] and the mortality was low from then on out. In 1938 it first came out the first part of July. The disease was noticed the last week of July and the first week of August. Then, as in 1937 the epidemic dropped and lingered for about [illegible]. The greatest number [illegible] I had handled with fairly [illegible] results. In 1939 very few cases were noted and most of these appeared late in the season. The herds had an average of three or four cases. In this year about 10% of the horses in this area were treated with [illegible] vaccine, and these vaccinations [illegible]. The [illegible] in the treatment of [illegible] for this year was to determine [illegible] of the [illegible] and [illegible]. The [illegible] were divided as the use of slings and racks for supporting sick animals. I gave [illegible] a spacious stall with plenty of bedding [illegible]. A good [illegible] and there is generally a good result. I use [illegible], normal saline solution, calcium gluconate, and [illegible]. The latter seemed to help the greatest portion of the [illegible]. Last year I had in the cases [illegible] but the encephalomyelitis [illegible] it was much more [illegible] than that of preceding years. The [illegible] was usually administered through the stomach tube after water was pumped in. [illegible] the patient taking rapidly the stomach tube was passed [illegible] and water pumped in to take care of the dehydration. [illegible] were given, only [illegible] as a part of the patient [illegible] to be [illegible] the treatment to [illegible] patient [illegible]. In the end cases I was most successful in cases that received the best nursing.

The treatment of disease might be compared to a football team, in that no one agent should be depended upon, but should have the help of others, just as a star player must have the cooperation of his mates. Let routine medicine be the center of your line, sanitation the wings, supportive medicine your ball carrier, hygiene and prophylaxis your blockers, the nurse your quarterback and yourself the coach who supplies -- well, most of all, just good old horse sense.

- - - - - - -

LAMENESS

Dr. C. C. Franks
Grimes, Iowa

Lameness may be defined as a pathological defection or irregularity of the organs of locomotion. Irregularities of this nature may be exhibited in a variety of ways. The stride may be lengthened or shortened. Again the limb or limbs may present a deviation from a vertical line drawn from the withers to the center of support.

Lameness may be anterior as evidenced by extension, or posterior when flexion is involved. Further classified, supporting leg lameness is evidenced when the horse shows greatest pain in putting weight on the limb, as in striking the ground. Swinging leg lameness is evidenced when pain is shown on elevating the limb and a tendency to trail the ground when in motion. In supporting leg lameness the causative lesion is generally below the knee. The lesions of swinging leg lameness are commonly above the knee. Lameness may be manifested in either repose, or motion, or both.

In the diagnosis of lameness, cultivation of the eye and an intense sense of concentration are necessary if one is to detect vague limps, tumefactions, abnormal warmth or minute exostoses. Tact and patience are also essential requisites, as fright or undue excitement in an animal may cause it to confuse you as to the location of a lesion, particularly if it is to be located by palpation.

It has always been my custom to first observe an animal as it is backed from the stall. Then examine it from the front, rear and both sides. Next have it parade away from you and toward you, first at a walk and then at a trot. Naturally if the animal is a saddle mount, it may be necessary to put it through all gaits under saddle. If inspection and palpation do not reveal the true seat and nature of the trouble resort to local anesthesia.

By this time one should have some idea of the exact nature of the complaint. Don't express yourself too freely until a thorough examination has been made. No greater pitfall in practice exists than to pass snap judgment on a case of lameness. Likewise no phase of practice is so conducive to building client confidence as ability to properly diagnose cases of this kind. In any kind of lameness check and double check the foot, because here is where so many times the lesions are found.

Starting with the foot we will take up first the mechanical entrance of infection, that is, trauma due to picking up nails, etc. Little variation of treatment is necessary. In our practice we deem free drainage as of first importance, next thinning of the sole to relieve pressure caused by inflammation of the soft structures. Place the foot in a warm antiseptic bath or pack, follow with dry dressings, these to be changed as often as necessary. To retain the dressing to a shod foot, cut a piece of sheet metal the same contour as the plantar surface, just a little larger than the inside measurement of the shoe. Bend it trough-shaped through its greatest distance, then place in position and hammer into shape again.

We still see some corns even among the unshod horses of the farms. In the dry type, characterized by a red spot due to extravasation of blood, pare down to relieve pressure, especially if the horse is barefooted; if shod, less paring is necessary. A bar shoe putting pressure on the frog will usually correct the trouble. In the suppurating type, our treatment is the same as that outlined for nail punctures.

Thrush, a common ailment found in our practice is most often seen in mules. If all the diseased tissue is carefully trimmed away the medicinal treatment is not so important. We paint the area with equal parts of phenol and iodine. In any obscure foot lameness thrush should not be overlooked. The reaction of the patient to palpation is practically nil, your diagnosis being made by the sense of sight and smell.

Canker sometimes called foot cancer is a chronic proliferation of cells within the papillae of the sensitive sole. This semi-malignant process has no tendency to produce horn but breaks down and either exudes a sticky fluid or presents a mealy appearance. There is no use in compromising with a case of canker. Actual cautery or the more drastic medicinal caustics, as nitric acid, silver nitrate, formalin, etc., may be used. It is both humane and sensible to resort to local anesthesia when cautery is applied. Above all else use plenty of pressure when dressing.

By this time one should have some idea of the exact nature of the complaint. Don't express yourself too freely until a thorough examination has been made. No greater pitfall in practice exists than to pass snap judgment on a case of lameness. Likewise no phase of practice is so conducive to building client confidence as ability to promptly diagnose cases of this kind. In any kind of lameness think and handle about the foot. Statistics show it is where so many times the lesions are found.

Beginning with the foot we will take up first the mechanical influence of infection, that is, trauma due to picking up nails, etc. Little variation of treatment is necessary. In our practice we deem free drainage as of first importance, next thinning of the horn to relieve pressure caused by inflammation of the soft structures. Place the foot in a warm antiseptic bath or pack. Follow with dry dressings, these to be changed as often as necessary. To relieve the pressure to a shod foot, take a piece of sheet metal the same contour as the plantar surface, just a little larger than the inside measurement of the shoe. Bend it trough-shaped through its greatest diameter, then place in position and hammer into shape again.

We still see some corns among the various lesions of the horse. In the dry type, characterized by a red spot due to extravasation of blood, pare down to relieve pressure, especially if the horse is barefooted; if shod, less paring is necessary; a bar shoe putting pressure on the frog will usually correct the trouble. In the suppurative type, our treatment is the same as that outlined for nail puncture.

Thrush, a common ailment found in our practice is most often seen in mules. If all the diseased tissue is carefully trimmed away any antiseptic treatment is not so important. We paint the same with equal parts of formalin and iodine. In any severe case lameness though should not be overlooked. The reaction of the animal to palpation is practically nil, your diagnosis being made by the sense of sight and smell.

Canker sometimes called foot cancer is a chronic proliferation of cells within the capsule of the sensitive sole. This semi-malignant process has the tendency to involve both the frog, sole and other tissues. Clinically it presents a very offensive odor. There is no use in temporizing with a case of this kind. Radical removal of the horn then use of medicinal agents, as arsenic acid, silver nitrate, formalin, etc., may be used. It is very tedious and requires attention to detail to treat satisfactorily unless radical measures are applied. Above all else use plenty of pressure when treating.

We now find toe and quarter cracks more prevalent in the unbroken colts than in the mature horses. The colts have long, untrimmed feet with an irregular ground line. A prying action takes place at one or more points resulting in cracks in the wall. Mechanical or surgical intervention must as a rule be resorted to before correction is accomplished.

Quitter, as you all know, is a purulent inflammation of the lateral cartilages. This abnormality is usually in the neighborhood of the heel and is shot through by one or more fistulous tracts which open up in the region of the coronet. Sometimes tendons, ligaments, joints and bones are involved. Quite often injuries of the coronet are the immediate cause, but again may occur as sequelae to wire cuts, nail pricks, corns, quarter cracks and furuncles.

Regardless of what treatment one plans to use the foot should be put in an antiseptic pack for at least forty-eight hours. Then shorten heel and toe and thin the sole. Various surgical technics and treatments have been suggested. We still stick to the method outlined by Dr. Joseph Hughes because it has been so successful in our practice. First irrigate with a formalin solution using one ounce to a quart of warm water. This is done with a continuous flow syringe. Next with a one-ounce hard rubber syringe, thoroughly impregnate the fistulous tract or tracts with a solution made up as follows: Mercury Bichloride 2 ounces; Hydrochloric acid, one and one-half ounces; water Q.S. one pint. Finally rub in a good blister all around the hoof head. It is very rare indeed, the treatment needs to be repeated.

Furuncles or boils are characterized by inflammation, swelling and excessive pain. They are most frequently found around the hoof head, quite well back in the hollow of the heel and pastern. Necrosis and sloughing follow. Unless synovial structures are involved the prognosis is favorable. This condition occurs most frequently in cold sloppy weather. Hence stable hygiene and proper care of the legs and feet are principles of prevention.

Place the affected foot in a warm antiseptic pack until sloughing is completed; then treat as an open wound. Never attempt to remove the core or slough by traction, for should a small portion break off and become buried by the ensuing healing process, it is only a question of time until you are right back where you started. The bacterial flora involved are usually staphylococci and bacillus necrophorous.

Ringbone is the development of an exostosis around the

pastern or coffin joint. We see high ringbones (median interphalangeal articulation) and the low type (Distal interphalangeal articulation). Because they are usually of the high type, ringbones of the hind limbs are most amenable to treatment. The opposite is generally true of the front limbs.

In handling low ringbones, we get best results from cold packs and stimulative treatment of the hoofhead to induce expansion. Blistering or firing, or both, of high ringbones as frequently resorted to in the hindlegs usually removes the lameness. A peculiarity of ringbones is they usually are seen in pairs or fours.

Sidebones, ossification of the lateral cartilages, are almost entirely peculiar to draft horses and are seldom seen on the hind feet. The treatment is the same as for low ringbone. In what I have seen of the creasing operation it only gives temporary relief the same as any other expansion method. In both ringbone and sidebone all excess hoof at the ground line should be trimmed away, the toe shortened and well-rounded. If the horse is shod, set the toe calk at about the first nail holes. This allows breaking over with the least possible flexion.

Strains and sprains are quite common, and are best handled by placing the patient in a well-bedded box stall with a level floor. Remove the shoes. Use a sling if necessary. Be sure the feet are as near normal dimensions as possible. If one is called immediately after such an accident occurs, cold applications are indicated. After inflammation is established, hot applications get the best results. Follow with mild liniments and liberal massage, then bandage. The application of a cast is sometimes beneficial.

In lameness due to chronic strains and sprains one may resort to blister, or finally, to firing and blistering.

Splints usually occur in horses five years old or under, and are most common on four year olds. Quite frequently a horse carrying a splint will walk sound and trot lame. Anodyne liniments, warm water compresses and rest are indicated. If the horse must be worked, shower the splint area with cold water, three or more times a day, and apply a wet bandage at night. If the splint is high it presents the same pathological condition as a jack and should be treated accordingly.

Bone spavin like ringbone may be large in size and still cause no pain, consequently no lameness, due probably to complete ankylosis. When lameness exists with no perceptible enlargement

they are called blind or occult spavins. Contrary to ringbones, high spavins are the hard ones to handle, while the low ones respond readily to treatment. We like line firing and blistering as a treatment. Sometimes this procedure is augmented with punctures.

Bog spavins, thoropin and curbs are handled by anodyne liniments with hot wet bandages in the early stages followed by blistering and firing. Lameness of this type is not so hard to overcome, but reduction of the synovial distentions presents quite a problem. Especially is this true of bog spavins and thoropins. In a few cases where no lameness has been present spontaneous recovery results.

Capped hock and shoe boils: Whatever your treatment may be, always tie the animal so it will have to stand. Internal iodine is of value in treating. Among the odds and ends of lameness cases, which come to our attention are:

1. Brachial paralysis: Rest and mechanical intervention to hold the leg in position.
2. Rupture of the flexor metatarsi: Rest is the most helpful factor in a comfortable box stall.
3. Open Joints: Beware of overtreatment locally. We generally apply a blister; keep animal standing even if slings are necessary. This prevents infection being picked up, as well as irritation, while getting up and down. Bacterins are always indicated.
4. Obscure lameness in some instances of late years has been traced to rations deficient in the proper minerals. Some recoveries have been accomplished by simply feeding legumes such as alfalfa or the clovers.

Lameness of the shoulder or hip is comparatively rare, and is commonly the aftermath of some terrible strain or blow. When all your efforts and ingenuity have been expended in trying to locate an obscure lameness, and have failed, when plenty of time has elapsed to allow any suppurative process that might be lurking around a foot to make itself apparent, then and then only blame the shoulder or hip.

- - - - - - - - -

INDIANA SHEEP PROBLEMS

Dr. George L. Clark
Columbia City, Indiana.

The sheep industry has made a marked growth in Indiana in the last few years. Formerly one-half of the sheep of Indiana were to be found in the northern third of the state, but this is no longer true as sheep have made a perceptible gain in numbers in the central and southern portions.

I wish to give a very short resume of sheep diseases as I have found them in my practice:

The practitioners should know the different breeds and be able to talk intelligently with the flock owners concerning breeds and type, feeds, housing and care at lambing time, the type of bucks to use, feeding and care of orphaned lambs and general care of the flock. As for the diseases of sheep, one is seldom called to treat individual cases. Usually it is flock treatment or preventive medicine.

It is my experience that parasitism heads the cause of losses in flocks. Chiefly we have to deal with the stomach worm, intestinal or round worm and tapeworm. Parasitism can usually be diagnosed clinically. But if there is any doubt, you can find either a sheep that has just died, or better still, one about ready to pass out, and hold a post-mortem.

For gastro-intestinal parasites there are many drugs or preparations of drugs used, but I feel copper sulphate is the drug of choice and I advise a 1½% solution with 1 ounce of black-leaf-forty to the gallon of this solution. The sheep should be starved for twenty-four hours preceding the treatment and allowed no water to drink the same day following the administration. The dose is one to four ounces, depending on the age and size of the sheep, repeated every twenty-one days where sheep are on infected pasture.

It is not uncommon for the owner to tell me he has been treating his sheep with copper sulphate but did not get the results that I did with my treatments. This, I think, is largely due to the fact that unless so directed, often the sheep are not starved long enough, and the owner gets his blue vitriol from the drug store and it is usually the commercial product. The veterinarian should always use the chemically pure copper sulphate, as the ordinary is not reliable.

Lately I have been using a commercial product which is chemically pure -- copper sulphate combined with one of the dyes, which I find is better than the copper sulphate alone.

But we must not forget rotation of pasture. General hygiene and good feeding practices for the dosing with drugs alone will not make up for good feed and sanitary conditions in sheep with parasites.

Lung worm is not common in this section, but occasionally one may find them. An oily extract of pyrethrum injected into the trachea in three c. c. doses seems almost specific.

Nodular disease also is due to a parasite present in almost every flock. But up to this time we could offer no satisfactory treatment. Recent literature holds promise that an effective treatment is found, not yet available to the practitioners.

Dystokia is quite common in ewes and is usually very satisfactorily handled, and we find it makes a nice office business as the owner will usually put the ewe in his car and bring her in.

Pregnancy disease or Acidosis is a common ailment. I have used calcium gluconate, dextrose, calcium chloride, sodium bicarbonate and what have you, and as yet have found no satisfactory treatment for the ones that are sick, but find the feeding of molasses a sure preventive for this condition.

Hemorrhagic septicemia is not uncommon in sheep that have had long ships or have been in the stockyards; and nowhere do we get better results from Hemorrhagic septicemia bacterin than in sheep.

Sore mouths or lip and leg disease is often met with in feeder lambs soon after they arrive. Here again vaccination seems to give very good results, cutting the duration in the affected lambs and stopping the spread to the healthy ones.

Foot rot has given a lot of trouble in some localities. It is easily diagnosed and usually treated by driving the sheep through a concentrated solution of copper sulphate. But I think a dry treatment of twenty to forty per cent of finely powdered copper sulphate in slack line is much more effective and easier to use, as sheep do not like to get their feet wet and there is some trouble to make a vat to drive them through. While with the dry treatment, it may be placed in a doorway, at a gate or other convenient places where the sheep will walk through of

their own accord several times a day. This also applies to cattle.

Sheep scab has been quite common in northern Indiana, but it is not necessary for me to dwell on this as you can all diagnose this and know that the lime and sulphur dip, repeated between the tenth and fourteenth day, is a very effective treatment.

The diseases of the digestive system of sheep closely resembles the digestive trouble of cattle and are to be treated with saline purgatives, anti-ferments and stimulants, as in cattle. Some flock owners see that sheep will not eat anything that will injure them, but we often find trouble with moldy feeds which give rise to a severe diarrhea followed by gastro-enteritis. This is particularly fatal to ewes heavy with lambs causing abortion and metritis. The treatment is quite satisfactory if started early and consists of a complete change of feed, clean quarters and the administration of stimulants, anti-ferments and intestinal antiseptics.

During the winter and the wet months of spring respiratory troubles are common. The first noticeable symptoms are nasal catarrh followed by bronchitis and pneumonia. This condition may be corrected or, better still, prevented by sprinkling molasses and cod-liver oil on the feed.

Sheep, if properly cared for, will give the owners greater returns for the money invested, labor required, and feed consumed than any other kind of livestock on the farm; and with their increase in numbers, there is an opportunity to add something to the annual income of the Veterinarian.

- - - - - - - -

PRESENTATION OF DR. R. A. CRAIG'S PICTURE TO PRESIDENT ELLIOTT, REPRESENTING PURDUE UNIVERSITY

DR. J. L. AXBY: Dr. Elliott, Members of the Association, Ladies, Guests and Visitors: Having been delegated by the Association to perform a duty which is next on the program, permit me to say that in the latter half of the year 1938, representatives of the Fraternity Epsilon Sigma Phi, and representatives of The Indiana Veterinary Medical Association discussed the possibility of having a portrait painted of one of Indiana's distinguished and representative professional men.

Following this tentative discussion, the matter was laid

before the Indiana Veterinary Medical Association when in convention assembled one year ago. The Association unanimously voted that they sponsor the collection of voluntary contributions from the veterinarians in Indiana for the purpose of defraying the expenses of painting the picture of this man, its framing and structural lighting.

At the time of these discussions this gentleman was alive and actively engaged in the duties of his office and profession. Fortunately he lived long enough to be able to sit for the painting of his picture by Marie Goth, of Nashville, Indiana, a very distinguished portrait painter.

Shortly following the last sitting for this purpose, this gentleman met with a very tragic and fatal accident, departing this life to that bourne from whence no traveler ever returns.

It was our hope originally that he might be alive to enjoy this friendly gesture of respect and esteem, in proportion to the enjoyment and pleasure the veterinarians of Indiana received in contributing toward defraying its expense. While he has been denied this pleasure, our pleasure in a diminished degree, has been permitted to materialize.

At this time we do hereby and now unveil the picture of this distinguished gentleman - Dr. R. A. Craig, Chief Veterinarian of the Veterinary Department of Purdue University, Lafayette, Indiana, and to you, Mr. President, we present this picture, hoping that you will accept it as a gift to the wonderful University of which you are President, which he for forty years served so well, and ask that it be cared for and guarded well in the future, that posterity may have an opportunity of viewing the portrait of this man, who rendered such valuable service relative to livestock diseases and livestock sanitation. We feel assured every person who looks upon it will be proud and appreciative for its having been done, and for our part as fellow-veterinarians, who knew him so well for so many years, we hope that it will be hung in a hall made more famous by its presence in association with the pictures of other men who have honored Purdue University, their profession and the State of Indiana. We trust, as time goes by, any person becoming downcast and forlorn, after looking upon this portrait will receive a new inspiration to go out and go forward, determined to reach new attainments and new accomplishments, such as would have been desired by Dr. Craig, a friend to humanity, a conserver of the health of livestock.

This we do, that it may not be said, "We forgot".

- - - - - - -

ACCEPTANCE OF DR. R. A. CRAIG'S PICTURE IN BEHALF OF PURDUE UNIVERSITY

Dr. Edward C. Elliott
President, Purdue University
Lafayette, Indiana

Dr. Axby, Ladies and Gentlemen of the Indiana Veterinary Medical Association: By this generous and gracious act, and through the moving words of Dr. Axby, you do more than memorialize a man. You pay tribute to the institution of which he was such a vital part through so many years, and above all, you honor your great profession.

It is of the man, Dr. Axby, that I would speak first. There are some of us who are firm in the conviction that the greatest of the works of the world are done by silent men working in silent places. Such a one was Dr. Robert Alexander Craig -- this knight of learning, this member of the house of peers of teaching, this sensitive and consecrated scientist, whom you proudly claimed through his working life, and now you render homage to his spirit.

Last night when I returned to my home, after one of those customarily idle evenings that I spend, I went to my desk to reflect upon this moment. There came into my mind the phrase, "Knight of Learning," and I thought of another knight described by an early English poet, six hundred years ago, when he inscribed his Canterbury Tales. Turning to my book shelf, I pulled down this well-thumbed volume and re-read this English poet's description of his knight:

> "A knight ther was, and that a worthy man,
> That fro the tyme that he first bigan
> To ryden out, he loved chivalrye,
> Trouthe and Honour, fredom and curteisye.
>
> "And though that he were worthy, he was wys,
> And of his port as meek as is a mayde.
> He nevere yet no vileinye ne sayde
> In al his lyf, un-to no maner wight.
> He was a verray parfit gentil knight."

On the morning of the last exercises for Dr. Craig, his pastor, Dr. T. A. Williams, of LaFayette, used a phrase in the course of his eulogy of Dr. Craig that sticks in my mind.

"The anchors of modesty" -- for such describes this quiet,

retiring, humorous, industrious, consecrated servant of his generation. And for myself and for Purdue University, and in this presence, I salute this Master Craftsman of the fine art of living for the benefit of others.

I said you paid tribute to an institution, and I am sure that if he can hear me at this moment, he would want me to tell you that by this exercise and through this portrait, you did more than recognize the human being called Craig. What you really intended to do was to pay a tribute to the great institution of which so long he was a vital and necessary part.

I think I should agree with Craig, standing fast because of his anchors of modesty, that that is what would in the long run be the effect, because those in the years to come who stand in the hall where this portrait shall be hung, will see on this canvas not the likeness of a human being, but the shadow of that human being which is the University. It has been said that all great institutions are but the lengthened shadows of a man or of men. At no time or in no place is that truer than here because the University, in all of its power, all of its achievements and all of its promises, is nothing more than the consecrated essence of such as Dr. Craig.

We pay homage to a man, we pay tribute to an institution, but unconsciously your generosity will return to your own profession, because in the years to come students -- yes, above all, students in the sciences that make up your profession, will see in this a symbol of the faith of a profession in one of its master practitioners, and above all, confidence in the great institution thru which he implemented the altruism and the benefits that reside in your profession, and so, Dr. Axby, with humility, and with the truest appreciation, the University accepts this portrait of Dr. Craig, assuring you that the portrait will find a place, not in the gallery of the gods, but in the gallery of men who, while on earth served as gods.

.... Playing of "Hail Purdue" ....

DR. R. A. CRAIG PORTRAIT FUND

THE COMMITTEE

Dr. D. D. Baker - President,
Indiana Veterinary Medical Association
Mr. Ed. Penticost, Chairman -
Dr. J. L. Axby
Dr. F. W. Bratten
Dr. F. W. Brown
Dr. C. C. Donelson
Dr. J. L. Kixmiller
Dr. J. C. Schoenlaub
Dr. Walter K. York
Dr. Charles C. Dobson, Secretary-Treasurer,
Indiana Veterinary Medical Association.

First money turned over to Treasurer, March 25, 1939.

Total amount collected	$ 470.50
Total cost of portrait, including frame, Light, Letters to Veterinarians and Inscription Plate . .	466.08
Balance . . .	$ 4.42
Reverted to Treasury of the Indiana Veterinary Medical Association .	$ 4.42

There were 210 Veterinarians who subscribed to the fund.

Portrait by Marie Goth, Nashville, Indiana presented to Dr. Edward C. Elliott, President, Purdue University, by Dr. J. L. Axby, State Veterinarian, January 10, 1940, Severin Hotel, Indianapolis.

CONTRIBUTORS

A. L. Albright
L. L. Anderson
G. W. Andree
R. C. Applegate
J. E. Anderson
Wm. Albright
J. J. Arnold
L. E. Andres
W. Alter
J. L. Axby
Odell Archer
E. D. Anderson
C. Albertson
D. D. Bradbury
H. E. Bryan
C. R. Baumgartner
H. R. Brown
H. M. Bonifield
H. W. Brown
D. D. Baker
Frank H. Brown
E. F. Brown
G. E. Botkin

CONTRIBUTORS (Continued)

F. W. Bratten
F. R. Bartlow
E. H. Byrd
M. V. Burgett
L. E. Beil
H. R. Basinger
John F. Bullard
H. Busman
G. M. Blubaugh
G. W. Bardens
E. E. Boles
W. V. Billhymer
S. E. Bowman
H. M. Bratt
Silas Brenton

C. E. Chapin
F. E. Catt
Ira V. Carpenter
J. A. Cook
O. E. Chattin
J. L. Craver
C. C. Clay
E. A. Cahill
Geo. L. Clark
O. B. Curry
O. M. Catey
J. E. Carrico
C. E. Call
A. B. Carter

E. E. Coshow
R. F. Dean
C. C. Donelson
G. E. Dershem
A. L. Delez
J. A. Dragoo
J. M. Drodge
H. W. Demsey
Charles C. Dobson
A. M. Drudge
L. P. Doyle
Lee DeMott
H. L. Decker
E. J. Dittman
H. O. Elliott
N. C. Elberson
N. W. Elsbury
G. C. Emick
A. S. Einoris
H. F. Emick
Ray Elrod
G. M. Funkhouser
R. G. Feller
E. W. Fry
Chas. W. Fisher
L. M. Friedline
L. O. Fish
W. G. Flora
S. M. Friedley

A. F. Ferguson
W. S. Gochenour
W. G. Galloway
C. H. Gates
George W. Gillie
S. F. Gaynor
John J. Glover
W. H. Gruner
H. J. Gray

Earl Higgins
G. D. Hambaugh
H. Meade Hamilton
W. A. Heck
D. C. Hancock
Roscoe Hyde
C. P. Hodson
C. J. Hufty
B. E. Helms
R. J. Hoskin

CONTRIBUTORS (Continued)

E. S. Hess
E. S. Hinkel
M. D. Henley
V. S. Huffman
R. J. Hall
T. Hyde
C. T. Howard
W. R. Horn
Eugene Ingeman
O. G. Jaynes
E. W. Kline
W. C. Kortenber
G. E. Keith
S. G. C. Kelley
C. P. Kine
J. L. Kixmiller
R. E. Kepner
E. U. Kingery
L. C. Kegin
O. E. Lowe
W. H. Lane
H. A. Lidikay
W. E. Lowe
T. W. Larrabee
F. R. Lockeridge
J. R. Lair
Paul S. Lindley

W. B. Massie
J. H. Mills
B. E. Meyers
Frank J. Muecke
E. A. Miller
A. A. Masker
D. E. Mangas
H. J. Magrane
J. R. Martin
S. J. Marquardt
H. A. Miller
E. S. Mohr
Frank P. Matthews
H. L. McCormick
E. C. McConnel
J. N. McPhail
J. C. McDaniel
F. V. McIntyre
M. O. Nottingham
R. G. Oosten
C. D. Owens
E. S. Penticost
Fred Pursley
E. C. Rayl
F. R. Roberts
N. W. Neff
B. C. Orenbaum
J. W. Oltmanns
O. C. Petry
L. R. Peters
F. G. Roth
N. B. Reynolds
John O. Riester
M. M. Seeger
R. L. Smith
C. Harvey Smith
A. F. Sanders
J. J. Shuff
H. A. Smith
V. F. Saylor
Harry Seevers
C. G. Swindler
T. L. Steenerson
J. C. Schoenlaub
R. F. Smith
W. F. Smith
C. F. Sheets
Paul Stanley
D. I. Scudder
A. C. Spivey
J. A. Schwartz
O. C. Shockley
T. A. Sigler

CONTRIBUTORS (Continued)

C. W. Striggle
J. J. Sharp
E. J. Tansey
F. C. Tucker
J. M. Tade & Son
M. M. Shaw
C. E. Sharp
J. E. Tinder
M. Tanner
F. M. Tibbett
M. G. Talbert

Edgar D. Wright
P. T. White
Paul H. Wagaman
D. M. Woollen
L. A. Wood
H. C. Wilson
W. E. Welbourne
R. E. Wood
Roy B. Whitesell
G. M. Wagaman
E. C. Williamson
D. C. Wood
R. W. Wann
H. J. Weaver
G. J. Webb
S. D. Wiles
F.L. Walkey

Walter K. York
O. K. Young

A. D. Zachary

PRESENTATION OF GOLD KEYS

By Dr. R. E. Kepner

It now becomes my duty to present the keys to all of the Past Presidents of our Association. As your name is called, please come forward.

Dr. E. D. Anderson
Dr. J. L. Axby
Dr. F. W. Bratten
Dr. C. A. Call *
Dr. H. W. Demsey
Dr. Geo. W. Gillie *
Dr. J. L. Kixmiller
Dr. J. H. Mills *
Dr. H. A. Smith*
Dr. H. E. Whiffing
Dr. R. C. Applegate
Dr. D. D. Baker
Dr. H. E. Bryan
Dr. R. F. Dean
Dr. L. C. Finley
Dr. H. Meade Hamilton
Dr. L. J. Klotz *
Dr. T. A. Sigler
Dr. F. C. Tucker
Dr. L. A. Wood*
Dr. H. G. White

(* Note: Due to unavoidable circumstances, these gentlemen were unable to be present in person. Their keys were forwarded by mail.)

Doctors, the veterinary profession and this Association comes tonight to do honor to you. As I stand here and visualize you, I know well what you have done for this Association in the past. Each and every one of you represents a year of service to this great profession; each and everyone of you is a building stone, year by year, that has made it possible for this, our State Association, to be on a sound and firm foundation.

As I look at you I can see the throb of life as gently resting on some of your silvery brows, and as I glance in your eyes, I can appreciate the fact that the anticipations of youth have seemingly passed away. Again as I visualize you, I can appreciate that you have a stern look of accomplishment. You have labored long, you have been honored, you have worked and you have humbly come back this evening to receive farther hopes from this Association that you all so dearly love.

We come to honor you tonight with a key, a little golden key, if you please, and some day perhaps -- I hope in the very distant future -- your feeble hands will have placed this in its last resting place, and perhaps some future generation looking through the archives and the secret hiding places shall have encountered, and upon thorough investigation and examination, they will have

once belonged to you, and I will assure you that they will be happy and proud to know that you so honorably earned these.

Take them and keep them, with the best regards of this, The Indiana Veterinary Medical Association. (Applause)

- - - - - - - - - -

REPRODUCTIVE DISORDERS IN CATTLE

Charles E. Fanslau, D.V.M.
New York, N.Y.

Mr. Chairman and Fellow Veterinarians: The film which you are about to see deals with reproductive disorders in cattle. This picture, made under the supervision of Professor Gotze of Hanover, was shown at the Thirteenth International Veterinary Congress in Zurich, Switzerland, in August, 1938. At the request of a number of American veterinarians who saw the pictures at that time, arrangements were made by the Winthrop Chemical Company to import the film for the benefit of American Veterinarians.

It is recognized that the maintenance of valuable pedigree strains and economical animal husbandry are impossible without an effective control of reproductive disorders. The object of this film is to demonstrate the importance of these disorders and to illustrate the diagnosis, general consideration and treatment of the various conditions involved.

As insufficient importance is often attached to reproductive disorders in male animals it has been considered advisable to deal separately with the examination and treatment of the male genital organs. A strict choice of breeding bulls with regard to health, sexual disposition and productivity is essential. The sire must be of a good male type and possess perfect sexual organs. In the case of impotent bulls, the ejaculate which can be obtained most easily with the aid of a rubber double-walled vagina placed in a cow in heat or in a phantom, must be examined. Externally recognizable defects include micro-orchidy, monorchidy, orchitis, tuberculosis of the testes and scrotum, infantilism, and hemorrhage and blood fistula of the penis.

The film shows photomicrographs of compact and very active spermatozoa, and of motile and non-motile pathological spermatozoa. Sires with macroscopically or microscopically defective semen should be excluded from breeding. Many and varied are the causes of impotentia coeundi (inability to mate); they include

painful conditions of the limbs, such as foot rot, interdigital growths and arthritis. In most cases these can be cured by surgery and rest.

The failure of erection at copulation is common in young bulls and can be cured in about 60% of the cases by myotomy of the retractor penis muscle and its fasciae. In adhesive inflammation of the prepuce, the adhesions can be broken down with the aid of high epidural anesthesia and the condition can be cured by irrigating with antiseptics.

Non-specific purulent inflammation of the prepuce is usually relatively harmless, but it is important to differentiate it from genital vesicular exanthema, which is transmitted at copulation. Irrigations and washings with soap, followed by antiseptics or colloidal iodine, usually cure both conditions.

Sterility in cows and heifers is even more important than sterility in bulls. Since the mastery of clinical pregnancy diagnosis is fundamentally necessary in every case before further measures can be adopted, its technique is shown in detail, starting from the condition of the virgin organs. The various abnormal conditions of the ovaries are shown in a phantom. Small and equally sized ovaries without follicles or corpora lutea indicate cows and heifers which fail to show oestrus or which are anaphrodisiac as a result of ovarian atrophy. This kind of ovarian quiescence is found in cases of high milk yield, underfeeding, overfeeding, unbalanced feeding and in chronic diseases, such as tuberculosis, distomatosis and foreign body disease.

Treatment of this anaphrodisia is directed at the general causes -- provision of pasture, change of diet, control of liver fluke infestation, etc. Massage of the ovaries and uterus, and hormone therapy are applied to stimulate ovarian activity.

Similarly the film shows anaphrodisia due to a persistent corpus luteum, or to a cyst of the corpus luteum, and its treatment, also the various forms of cystic degeneration. If the primary follicles are already altered by the presence of small cysts, the ovaries feel cartilaginous, hard and covered with small knobs. In such a case the animals have a week and irregular oestrus.

Thin-walled unilocular cysts over 1½ cm. in diameter, which may reach the size of a potato, are designated as persistent follicles or thin-walled follicular cysts, according to size. Nymphomania associated with them is not always pronounced. It is

more severe with thick-walled multilocular cysts. Among the disease changes of the uterus which can be diagnosed by rectal examination, the film shows the incurable chronic post-parturient endometritis and metritis, and tuberculosis of the uterus and oviduct.

Diagnosis and treatment of pyometria by expression of the corpus luteum of pregnancy, removal of the pus with a two-way catheter, irrigation with antiseptics, and injection of wheat germ oil are depicted. The film also shows a uterus containing a mummified foetus. Later the disease conditions which are brought to light by examination of the vagina and vulva are dealt with.

Defective closure of the vulva, resulting from atrophy of the pelvic fat through healed lateral or dorsal tears, or thru complete perineal rupture, can be cured by a plastic operation, but fertility can only be assured if the rest of the genital system and the oestral cycle are normal.

We further see the vaginal wall of a healthy virgin heifer; the mucous membrane is moist, mirror-like and glistening, and the os uteri slightly open in the form of a small crater. On the other hand, between the third and sixth months of pregnancy the mucous membrane is drier, does not glisten so much and the os uteri is tightly closed and covered with mucus. Other things shown in the film are vaginal mucous cysts, proliferation of the portio vaginalis uteri and a case of vaginitis due to disease of the urinary tract.

A section of film shows the diagnosis and differentiation between suppurative and non-suppurative post-parturient endometritis. Simple post-parturient endometritis is treated by injections of antiseptic or iodine preparations followed by massage.

Post-parturient, mucopurulent or purulent endometritis is treated by preliminary irrigations of the uterus with a normal saline solution by means of a two-way catheter and by infusions of iodine preparations.

The film ends with a reference to the importance of bovine brucellosis and to the control of diseases of breeding animals by regular examination, timely removal of incurably diseased animals, treatment of curable diseases, and above all, disease-free rearing of young stock. Only healthy breeding animals which have been well-nourished and kept under natural conditions can be fertile.

- - - - - - - -

PRESIDENT BAKER: The Board of Directors of this Association had a luncheon meeting today with the Board of Directors and Officers of the Farm Bureau organization here in the hotel. They are enthusiastic and appreciated our convention, and I am sure that the co-operation that was evidenced in that meeting will go far toward helping the veterinary profession, as well as helping the Farm Bureau. I told them that I hoped that it would become a custom for this co-operation to continue.

Is there any other business to come before the Association? If not, the new officers come forward to be installed.

President - Dr. Kepner; Vice President - Dr. Botkin; and Secretary Dobson.

The new officers will stand in front of the table.

By the authority vested in me by this Association, I have these appointments and resolutions to pass on to the new President:

1. Appointment of a representative to the M-Day Committee.

2. Resolution to draw up and investigate a prior lien law.

3. A letter to the Poultry Committee of the A. V. M. A. that we would avail ourselves of the special conference on poultry in this state.

4. That we favor a correction of the rabies law.

Gentlemen, I know that the Association will be in good hands the coming year, and it is with my very best wishes that I pass to you, Dr. Kepner, the responsibility of The Indiana Veterinary Medical Association.

DR. KEPNER: If there is no other business, the meeting is adjourned.

ADJOURNMENT

4:30

INFECTIOUS ANEMIA IN HORSES

Dr. W. S. Gochenour
Director of the Pitman Moore Company Biological Laboratories
Zionsville

The Motion pictures on Infectious Anemia (Swamp Fever) were prepared by the Pathological Division of the Bureau of Animal Industry, Washington, D. C. Your Committee, knowing that the investigations of this disease by the Bureau and the preparation of this film were under my direction while in the employ of the Bureau, requested me to comment on these pictures as they are shown.

The object of preparing this film was to show the clinical symptoms seen in known cases of the disease so that similar symptoms presented to the practitioner will bring to his mind the possibility of Infectious Anemia, especially where the clinical picture does not readily establish the presence of some other definite disease condition. There is little doubt that many cases of Infectious Anemia are not recognized as such. The pictures will also show that some animals known to be infected show no clinical symptoms of any kind over a period of years. Such animals having all the appearances of perfect health are dangerous for the reason that they are persistent carriers of virulent virus and, therefore, potential disseminators of the disease. They are unsuspected reservoirs of infection.

It will be noted in the epitome now showing that Infectious Anemia is widely distributed and is the cause of serious loss of horse and mule power in certain parts of the United States, particularly in the Mississippi delta. There are also some losses of animals through death. Infectious Anemia has been definitely diagnosed in the State of Indiana. It is reasonable to believe that many cases are not recognized.

The disease is caused by a specific filterable virus and is believed to be most commonly transmitted from affected to healthy horses through virus-contaminated pastures and feed and by biting insects. In an experiment recently conducted by the Bureau, transmission was effected by intimate stable contact where infected and healthy horses were allowed to eat hay from the floor, eat grain from a common trough and drink water from a common trough. In this transmission experiment, flies and other insects were excluded from the stable by tight screens on all windows and doors. The disease did not spread where infected and healthy horses were housed in screened stables,

INFECTIOUS ANEMIA OF HORSES

Dr. [illegible]

Director of the Pitman Moore Company Biological Laboratories

Zionsville

The motion pictures on Infectious Anemia (Swamp Fever) were prepared by the Pathological Division of the Bureau of Animal Industry, Washington, D. C. Your committee, knowing that the investigations of this disease by the Bureau and the preparation of this film were under my direction while in the employ of the Bureau, requested me to comment on these pictures as they are shown.

The object of preparing this film was to show the [illegible] symptoms seen in horses sick of the disease [illegible] of the disease. [illegible] [illegible]

It will be noted [illegible] [illegible] [illegible] that infectious anemia is widely distributed and is the cause of [illegible] loss of horses and mules in certain parts of the United States, particularly in the Mississippi delta. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]. Infectious anemia has been definitely diagnosed in the State of Indiana. It is reasonable to believe that many cases are not recognized.

The disease is caused by a specific filterable virus [illegible] on all windows and doors. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] provided with slip stalls and individual drinking buckets. Some investigators believe that transmission is most apt to occur while the animals are on pasture.

Horses, mules and donkeys are the only farm animals susceptible to this disease. Several instances of infection in Man are reported in the literature. At least one of these cases was proved by a horse inoculation test.

Laboratory animals are refractile to infection and can not be used for diagnostic purposes. There is no laboratory test of any kind that can be used to make a definite diagnosis. A definite diagnosis can be made only by horse inoculation tests. Obviously such a procedure is impractical save in instances where definite knowledge of the presence of the disease in a stable or in a given area warrants the possible sacrifice of a normal horse.

Experimentally the incubation period is usually from 12 to 18 days but where the virus is weak or of low virulence the time between inoculation and the appearance of symptoms may extend up to three or four months. Age or sex makes no difference in susceptibility.

Infectious Anemia is essentially a hot weather disease. Most of the cases are seen in the summer months when farm horses are at work and more deaths occur when the weather is hottest.

There are three forms of the disease - acute, chronic and latent or inapparent. Examples of each of these forms will be seen in the pictures. The first horse shown would be classed as a chornic case. In this riding horse Infectious Anemia was suspected by the veterinarian because of the increasing unthriftiness, loss of alertness and activity in spite of the fact that the animal was eating well and was consuming full rations of good feed. Edematous swellings developed beneath the abdomen which further suggested Infectious Anemia. Daily temperatures were, therefore, taken over a period of several weeks and these disclosed the typical intermittent fevers seen in Infectious Anemia. Blood samples were then drawn and inoculated into a healthy horse. Within fifteen to twenty days the test horse exhibited typical symptoms of Infectious Anemia.

Infectious Anemia in the chronic form is endemic in the Mississippi delta. The pictures of the mules now showing were taken in this area. In the delta the outstanding symptoms are

loss of weight, rough stary coat, edematous swellings that come and go, wobbly gait, loss of strength so as to tire easily, muddy appearance of the visible mucous membranes, with hemorrhages commonly occurring on the nictitans and the mucous membrane of the nostrils. The appetite in these animals is for the most part unimpaired. Many animals eat ravenously and continuously if feed is kept before them. Intermittent febrile reactions occur at irregular intervals at which times the animal is greatly depressed, refuses feed, loses weight very rapidly and frequently goes down from sheer exhaustion. Well-marked reduction of the red corpuscles can usually be seen during the febrile reactions, particularly as the temperature is returning to normal. In the intervals between the febrile reactions the blood picture is for the most part practically normal. In these febrile attacks the temperature usually rises to around 105° F. It may reach 108° F. The febrile attacks last four or five days after which the animal returns to normal.

The edematous swellings seen in the horses now showing are not present in all cases of Infectious Anemia. Some cases never show the swellings. These swellings may occur simultaneously with the febrile reactions or they may occur any time in the interval between febrile reactions. Sometimes the devebpment ofedematous swellings is the only symptom on which the disease may be suspected. The swellings are not confined to any one part of the body but occur most commonly beneath the brisket or abdomen or one or more legs may become swollen. In anthrax districts the edematous swellings of Infectious Anemia may be confused with those of anthrax.

Horses affected with the chronic form of Infectious Anemia may live for years if they are well fed, given good care, are not worked hard, freed of intestinal parasites and promptly on the appearance of febrile attacks are put to rest in cool, comfortable quarters, and are given supportive treatment.

Nux vomica, sodium cacodylate and dilute hydrochloric acid (10 to 20 cc of 5% solution) intravenously are most commonly used. The North Dakota Agricultural Experiment Station reported a horse affected with the chronic form of swamp fever that lived for fourteen years. This horse was shown by numerous horse inoculation tests to be infectious during the entire period.

We are now seeing on the screen typical cases of the acute form of the disease. In this form the onset is sudden,

the temperature rises to 105° to 108° F. Breathing is rapid and of the abdominal type. A well-marked ridge is seen extending from the point of the ileum to the sternum. The animal is depressed, the head hangs low, there is extreme weakness, and the body weight is shifted from one leg to another. The hindlegs are placed well forward under the body. The gait is wobbly, There is an anxious look in the eye with evidence of much pain. The mucous membranes are congested. Feed is refused and the loss of weight is very noticeable. Death usually overtakes the animal in four or five days but occasionally slight improvement may occur only to be followed by a relapse from which the animal does not recover. In the sub-acute form two or three attacks in rapid succession terminate in death in about a month's time. As in the chronic form, a reduction in the red corpuscles takes place during the febrile attacks. Field demonstration of the anemia may be made by drawing about four inches of blood in a test tube in which a pinch of powdered potassium oxalate has been placed to prevent clotting and comparing the sedimented red cells with those of a similarly prepared sample from a normal horse. It should be remembered, however, that in the periods between the febrile reactions the blood picture is normal and evidences of anemia can seldom be seen.

The pictures now showing exemplify the latent or inapparent form of the disease. These animals are known to be infected, having been proved so by horse inoculation tests. It will be noted that they appear normal. They are in good flesh, alert, have smooth coats, their temperatures remain normal and they behave like any other horse in perfect health. However, each of these animals is a carrier of virulent virus at all times. Approximately four years ago, blood was drawn from the horse now being shown and although this horse appeared perfectly normal for over two years, injection of its blood into ten normal horses, caused death within thirty-one days from Acute Infectious Anemia in nine, and the chronic disease in the remaining one. So far as I am aware this horse is still alive and in good physical condition.

The Wyoming Experimental Station reported a case where an eighteen year old horse was infected experimentally and the animal lived to be thirty-three years old. This horse was proved by horse inoculation tests to be infectious until its death.

The pictures now on the screen show some of the lesions that may be plainly seen in some cases. The lesions

produced by Infectious Anemia are quite variable. Sometimes they are extremely well-marked so as to present a most striking appearance; in other cases they are so slight as to escape detection unless one has had considerable experience with the disease. Usually the acute cases present the most marked and extensive lesions; sometimes, however,a chronic case will show lesions that could not be overlooked. The most constant gross changes are hemorrhages on the serous and mucous membranes, enlargement of the spleen, heart, liver and kidneys. Hemorrhages of varying sizes from fine petechia to large suggulations are seen on the pleura covering the ribs, the pericardium, peritoneal coverings of the small and large intestines, the surface of the spleen and kidneys, the mucosa of the digestive tract. Kidneys resembling the "turkey egg" kidneys seen in advanced cases of hog cholera are not uncommon. The spleen may be three to four times normal size. The liver is almost always enlarged and presents a mottled appearance on the surface. On cross section the lobules stand out abnormally prominent. Large hemorrhagic areas are frequently seen in the marrow of the femur and humerus. The body fat and connective tissues frequently have a yellowish discoloration. It must be remembered that all of these lesions may not be seen in every case and as stated before in some instances they may be so slight as to be seen only on very careful examination.

Diagnosis of Infectious Anemia may be, therefore, for the most part a difficult matter since there are no symptoms or post-mortem lesions that can be considered characteristic or peculiar to this disease alone. However, if one considers collectively the history, clinical symptoms and blood picture at the time of febrile reactions a diagnosis with relative high degree of accuracy can be made. The recurring febrile reactions are most valuable from a diagnostic standpoint. In cases that terminate fatally, the finding of the previously mentioned anatomical changes will confirm the diagnosis.

The control of Infectious Anemia presents an even greater problem. The insidious nature of the disease, together with the lack of definite knowledge as to how the disease spreads in nature, and the want of a practical diagnostic test, precludes for the present, at least, any systematic program of effective control or eradication. In the Mississippi delta the disease is so common that destruction of known infected animals could not be attempted since new animals shipped into the territory sooner or later contract the disease also.

The Bureau of Animal Industry is actively engaged in a

study of this disease endeavoring to develop laboratory tests for the diagnosis of the sub-clinical cases, develop a vaccine to aid in the control of the disease in those areas where it is endemic and for the protection of animals exposed to sporadic cases, but the efforts along these lines have thus far been unsuccessful. The Bureau also conducted extensive experimentation seeking an agent or agents that would act specifically on the infection and effect a cure. Although many preparations were tried, including mercurials, arsenicals, various dyes, sulfanilamide and others, nothingwas found that would appreciably alter the course of the active forms of the disease or free any infected animal of the virus.

The Bureau is continuing the study of this disease. The cost of such an investigation is of such proportions that few agencies are in position to undertake the work. The economic importance of the disease from the standpoint of the horse industry as a whole amply justifies continued study by those who are able to do so.

It has been a pleasure to comment on the motion pictures just presented. I believe that we will be profited by having seen the symptoms of known cases of the disease in its several forms, and at the different stages of development, as well as the lesions to look for when autopsying a suspected case of the disease. A bulletin on this disease (No. 1819) is available at the Bureau of Animal Industry. I thank you.

- - - - -